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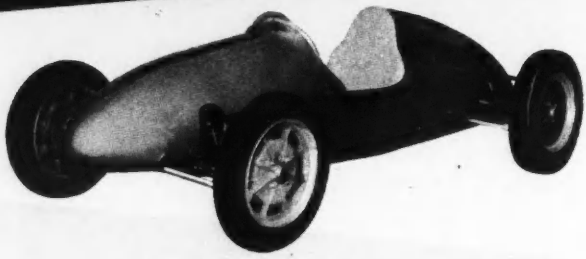

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CAR CRAFT

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COVER

The fine custom on the cover may not look like it now, but once it was a complete wreck. Jay Johnston bought it back from an insurance company and proceeded to rebuild it from the ground up. How he did it makes interesting reading on pages 32 through 35. *Ektachrome by Bob D'Olivo*

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547 Words From The Editor

TO OUR way of thinking, a good automobile is a mechanism for transporting one or more people from point to point in the shortest space of time in accord with safety, good sense and the laws of the land. To do this, it doesn't (at least at the present time) have to go 200 miles an hour; in fact, if it's going to be in accord with sense and the law, it can't.

The qualities it must possess, however, are threefold. It must turn when it should turn, stop when it should stop and move with somewhat more celerity than a horse-drawn hearse. Too many cars have been built that can classify under the term "bomb," with somewhat more justice than the originator of the term "going like a bomb" intended.

When, in this country and abroad, the end of the depression brought back the large car, unfortunately it didn't bring back the design quality of the pre-depression hot dog. It was then that the hot rod came into being. Youngsters from 16 to 60 took a long look at what was being offered to the public and also at what was then racing on various tracks around the country. They took Detroit's offerings, revamped them using the knowledge and ideas developed by the racing engineers. What evolved was the street roadster. Once 120 mph was really hauling in a roadster. Now roadsters have been known to top 190.

There's only one trouble. The cars that were safe with 180 horses and 120 mph can be, and often are, death traps at 300 bhp and 150 and better mph. America's hot rod contingent has been said to possess more real talent than any single group of professional automotive designers in the world. That statement may be somewhat exaggerated, but be that as it may, the engine development work carried on by the hot rodder is something that even the heavyweights in both America and Europe find hard to believe. This certainly represents progress. What all this is leading up to is that all this horsepower is getting stuffed into the old tried and true rod. Progress here, though not grinding to a halt, seems to be stagnating. This is largely our own fault. Busy with engines and accustomed to sneering at what the professional engineer designs as being something to sell to old women, we've closed our eyes to one or two important facets of that very thing we've been shouting about all these years: the safety of the chassis itself.

The engineer has gone ahead in his air conditioned lab and brought out a whole slew of new goodies which could just as well be incorporated in today's roadster or coupe. When you stuff that new hot rod together take a look at some of those late model goodies. We hate to say it but we must, the solid axle, like the old and wonderful flat-head Ford (and here we shed a bitter tear), while not exactly obsolete, is fast becoming obsolescent. Let's face a few facts—if we're going to stay out ahead of the pack and stay off our heads doing it, we've got to take another look around. Progress is progress, no matter who makes it.

Happy New Year. —j. c.

Editor's Note—Since we were not very brief this month, the feature on Things To Come that usually appears on this page is relegated to the back page, page 66 that is. Next month we promise not to be so windy.

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LETTERS

CCM CUSTOM

Dear Sirs:

I have been reading your magazine for about five months now, and I think it's terrific, to say the least.

I purchased a '51 Ford about six months ago. It was very, very clean, and after reading your publication, I became a rabid custom fan, so I decided to try my hand at customizing. So far, I've put on skirts, pulled out the stock grille and installed a chromed custom straight grille bar, frenched headlight rims and had the top painted ivory and the bottom Hawaiian bronze.

I have plans to do some more work, and with the help of a magazine like yours, I will.

Thanks again for CAR CRAFT.

Bill Kiburz
Saint Louis, Mo.

You're welcome, Bill. We're happy to have been of some help.—Ed.

TOKYO CUSTOM

Dear Sirs:

We have just read your magazine from cover to cover as we do regularly every month, and came to the conclusion that you can help us. How? Well, we're a couple of custom enthusiasts, stationed in Japan and would like to tell of the hours of enjoyment we have had with other custom fans at home and overseas.

Enclosed you will find a few snapshots of our '41 Ford we made in Japan. When we bought the car it was a complete wreck, however we were able to restore it to our liking. We're quite sure if you printed the pix and following information in your magazine, it would show others that they can still keep up their customizing overseas. Many people probably think it's expensive to make a custom overseas; well, we'd like to set them straight and give them some encouragement. As an example we would like to use our Ford.

At present we have less than $700 tied up in the car and that includes the price we paid for the car in its original condition. We hope that you see what we are trying to put across and we know that you can do it for us. We would like to show a few of the pertinent facts on customizing overseas.

These items were done on our "Ron-Ray" custom:

1. It was completely dismantled, with the engine being worked on. We put headers, dual intakes and milled the heads for the present.

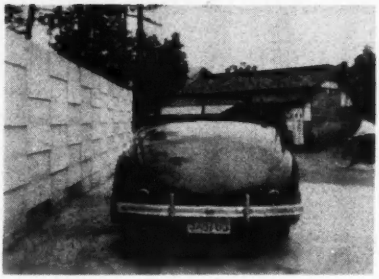
2. We removed all the chrome from the body.

3. We cut a one inch section out of the front fenders where they were joined previously and then welded the two sections together with a one inch strip of metal which strengthened the fenders.

4. Reversed our light brackets and frenched our headlights.

5. Welded a handmade front end piece and cut three holes for the grille, which was also handmade, and had it chromed. The front end is one piece other than the hood, as can be seen from the enclosed pictures.

6. We then added a section to our rear fenders and made some skirts which are nine inches in width.



7. We removed the gas filler door from the fender and relocated it inside the trunk.

8. Improved the trunk's action by installing a hydraulic lift.

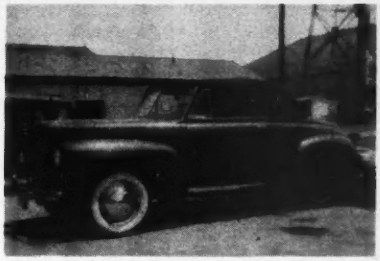
9. Cut the center bow of the top about two and one-half inches.

10. Taillight (with directional signals) were mounted on the bumper and the parking lights placed inside the front grille.

11. The seats were completely rebuilt. Seats, door panels and kick-boards are red and white three inch pleated leather.

12. A new black top was installed with a Jaguar window frame in the curtain.

13. Then the feature we are proudest of was put on; that being the lacquer job. It is nine coats, hand rubbed "Burple." (It's a mixture of metallic blue and purple.)



14. The bottom part of the dashboard was chromed and the upper part sprayed with "Burple" left over from body paint.

Thanks a lot for giving us a few moments of your time.

Sincerely,
Ray Furgal, A 3c, USAF

P.S.—Partner is Ron Seaver, A 2c, USAF, Tokyo, Japan.

Thank you for the story, Ray. Just because a guy is overseas doesn't mean he can't continue his hobby. We've even seen good stuff come out of the deep boondocks.—Ed.

THE MOST

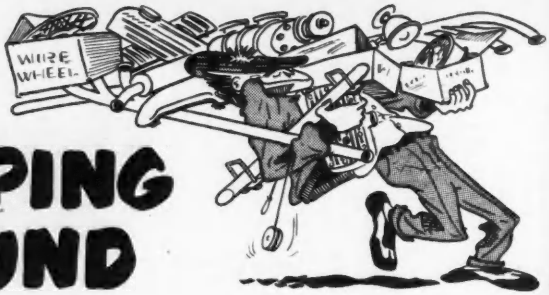
Dear Sirs:

I have decided to toss in my two cents worth. I have every issue of CAR CRAFT and HONK! that has been published and I can truthfully say that I have enjoyed every one.

It seems that some people don't like sports cars, some don't like customs, etc.

I am very pleased to see the fellows building competition sports cars. We have proved our engineering ability to the guys across the pond by taking production engines and modifying them to double or triple the horsepower. Now let's take production chassis parts and modify them to stand against the Ferraris and Lancias, to name a few . . . I have found your articles: "Grab Bag"; "Here's How"; "Torch Tips"; and "Garage Gimmicks" *the most!* I know that the fellows who desire to modify or customize their cars will back me up. I know that some fellows want to customize their cars, but are a little hesitant, for fear they'll make a costly mistake. Your articles give them the sound advice that they need.

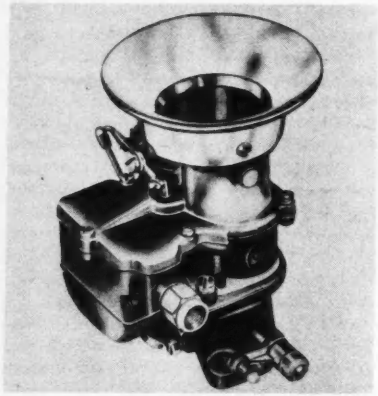
Sincerely yours,
Bobby W. Maus
North Carolina State College
Raleigh, N. C.



SHOPPING AROUND

CARBURETOR STACK

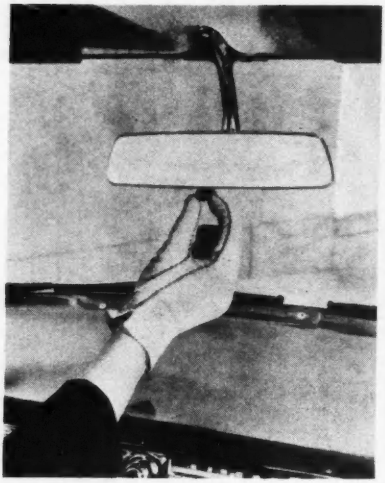
RACING FOLKS HAVE always gone for bright, shiny goodies that fit on top of carburetors. Some have been of problematical value and others have sound engineering principles behind them. One of the latter is a device that actually improves the venturi action of the carburetor, a method that has proved extremely successful on motorcycles and the smaller foreign engines. Bell Auto Parts has introduced a venturi type stack for induction tuning on larger engines which use the Stromberg, Chandler Grove and Holley carburetors. Although the effects of induction tuning on a large engine will not be readily apparent at lower rpm, dyno checks



show a very useable increase in efficiency at the top end of the rpm curve. Bell's new stacks are available from the manufacturer, 3633 East Gage Avenue, Bell 99, California, at $1.95 each.

GEAR SHIFT MIRROR

THIS NEW MIRROR has a three-way "gear shift" to reduce day and night driving glare. For daylight driving, 60 per cent of the total light is reflected, mostly in the yellow-green color range; for normal night



driving, 11 per cent of the light is apparent, in the high-visibility red range, and for very-high-glare conditions the reflection is reddish in color but with 97 per cent of the light filtered out. The varying colors are produced by literally "splitting" light beams. The mirror can be mounted in any model car and is designed to retail for $7.50. It's a product of the Liberty Division of Libbey-Owens-Ford Glass Company and will be available through auto parts houses.

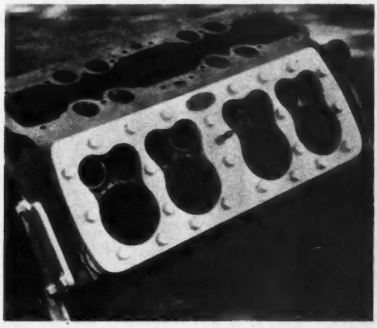
NEW BATTERY

A NEW TYPE of battery is now available which is guaranteed for the life of your car. Known as the G. E. Lifetime Battery, the new product is claimed to possess remarkable recuperative characteristics. The manufacturer guarantees a new replacement if the battery fails to recoup itself immediately after complete, rapid discharge; or if it should fail during the entire life of the car in which it is originally installed. Grids are made of Tellurium alloy and are said to last much longer than the grids in conventional lead-acid batteries. The G. E. Lifetime Battery

retails at $29.95 for the 6-volt, $34.95 for the 12-volt. It is available for all passenger cars and light trucks. Manufactured by and available from General Electric Storage Battery Co., 12381 Wilshire Blvd., Los Angeles 25, Calif.

TEST PLATE

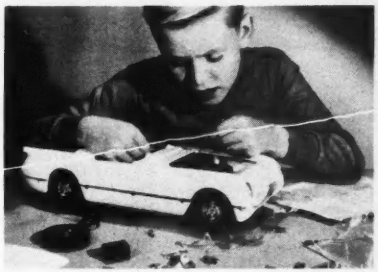
THIS TOOL is a Pressure Test Plate for testing water leaks in engine blocks and heads. It bolts on in place of the head, and seals off the water holes, thereby allowing the water jacket to be filled with air pressure by means of the tank valve located in the center of the plate. This allows pin-pointing of leaks in ports, cracks, and cylinders. Cracks and seeping sleeves can be permanently sealed by using the air pressure to force "block seal" into them. All ported and big bore blocks should be pressure-tested before assembly. Valve seats can be ground with the plate torqued in place to simulate a head, eliminating valve seat distortion common in Merc, and V8-60 engines. Better valve seal is guaranteed. All plates are precision ground and cadmium plated. Available for Ford and Merc '38-'54, $22.50 and



V8-60, $18.50. Plates for other engines available soon. Write: Crower Equipment Co., 1946 Moore Street, San Diego, Calif.

MODEL CARS

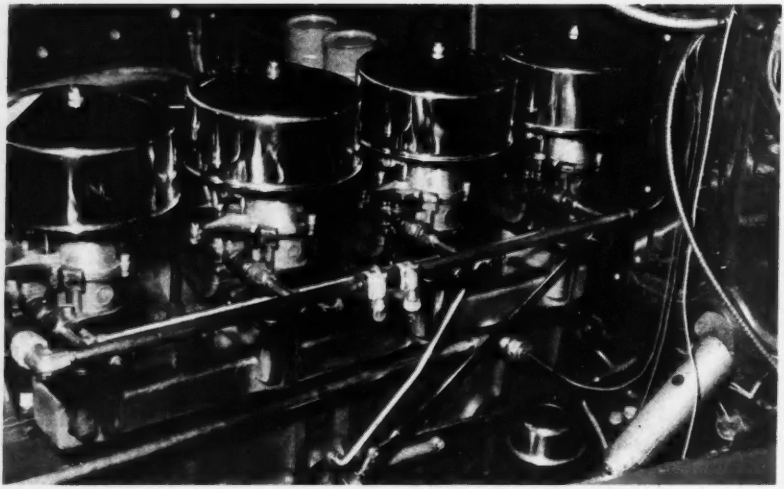
AN AUTHENTIC reproduction of Chevrolet's sports car "The Corvette" is now available as a do-it-yourself model kit. Made in scale detail out of high impact plastic,



the toy Corvette comes with 61 easy-to-assemble parts that can be put together or taken apart as many times as you like. The car measures 16 inches long, includes headlights that work by flashlight battery power, and has extra features such as a spare tire, separate wheels and a two-piece engine. The kit retails for $3.98 and is made by the Ideal Toy Corporation. Ideal also makes smaller scale model kits of the Jaguar, the Ferrari, the Pegaso, the Rolls Royce and the Mercedes Benz which retail for $1.00 each at model and hobby shops.

CHEV-GMC—CONCLUSION

The Competition Caper



Perfect synchronizing of these four Stromberg 81's gives Doyle GMC glass-smooth idle.

By Chuck Eddy

ENDEAVORING to get more facts in the case nearly proved our undoing this month. However, there are many areas of agreement among the Chev-GMC authorities which are worthy of consideration by any newcomers to the field. Before plunging into this last installment, one point deserves reiteration. That is the decision which must be made by the builder of *any* engine before he begins to lay out the "long green." Deciding what purpose the engine must fulfill to satisfy *you* is not only the most economical approach, but also the most time-saving. So many factors must enter into this decision that it is well to weigh them all before you begin building your *compromise*. And that is exactly what it will be, because the best engine, like the best marriage, is a good compromise. Some experts in the field tend to be extreme in their approach, resulting in the Go or Blow School. These geniuses always live by the motto, "If a little is good, more is better!" They bore to the thinnest, quavering cylinder walls, mill to the highest compression ratios, grind the cams to fantastic lifts and wonder why the engine won't hang together. We point this out because we feel that the GMC seems to encourage the extreme treatment from some of its adherents. The natural law of diminishing returns is still in effect, with the result that some of the smaller GMC engines will not only outlast

Completed . . . but the controversy continues

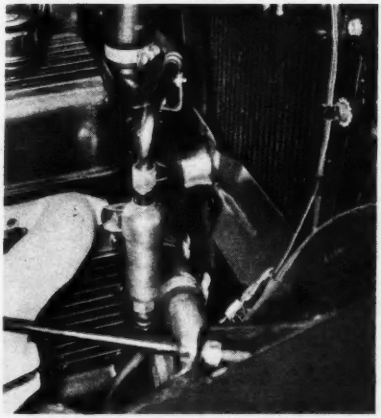
but out perform their big-bore brethren. To further explain the nature of the compromise, let's go back to where we started last month and bring out more facts about the bottom end.

Recent improvements in bearing construction for both main and connecting rod bearings have incorporated much more durability. This has been brought about not only through better bearing alloys but also through the use of thinner bearing *overlay*. Instead of a babbitt thickness of over .020 inch, which used to be common practice, the later bearings may employ overlay as thin as .005 inch! This naturally makes the insert non-resizable because there is not sufficient thickness to cut with the boring tool. The Moraine "400" bearings are of this type and are considered superior to the older "100" type. A particularly important precaution on their installation applies to the rear main inserts. One insert half (the upper) has two oil feed holes while the lower half has none. Reversal of the inserts from this position will result in disastrous oil starvation!

Other significant changes are incorporated in the rods. Later GMC rods have a narrower aligning groove for the bearing insert tongue. Use of the older bearing insert will result in the tongue being crushed with consequent bearing damage. Another distinguishing feature of the late rods is a narrower and thinner machined collar at the pin end. This may give better support to the pin bushings.

Significant also is the wider chamfer at the rod big end bore. The purpose of the changes at the rod big end was to allow

Photos by Bob D'Olivo and California Bill



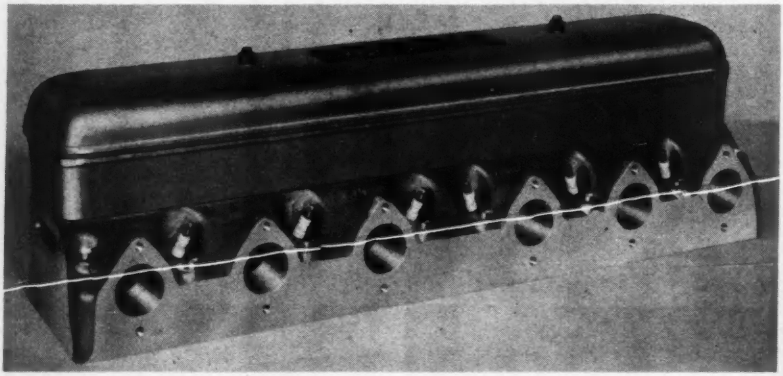
Fuel filter, scrounged from rocket plant scrap yard, is used in sanitary Doyle car.

Chrysler full-flow oil filter is adapted to the Doyle Jimmie as outlined in the text.

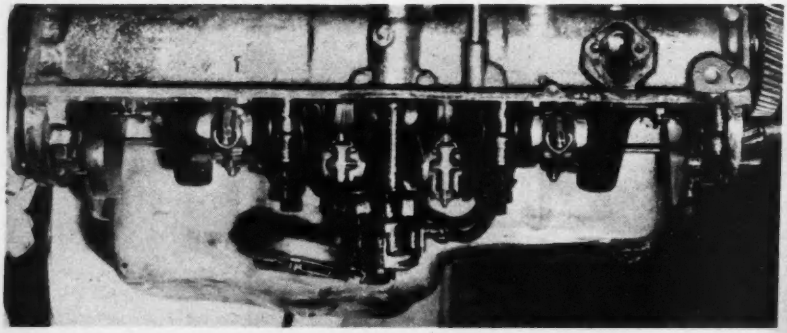
(*Continued from preceding page*)
more generous radii at all the crank pin and journal fillets. This is a desirable feature of the heavier, stiffer 302 crank. Incorporating larger counter weights than the 270 crank, this would be our recommendation whenever durability of the engine is of paramount importance. The only advantage that we can see in the use of the 270 crank might be in initial acceleration improvement due to less weight. Thus, some improvement *might* be noted over the 302 crank for a ¼ mile drag but the greater rigidity of the 302 would stand one in good stead for a long track event or road race. As crank shaft deflection is so much of a factor in bearing life, the con rod bearings for use with the 302, although narrower than the older 270, will outlast them. Again, this bearing design is to accommodate the large shaft fillet radii, an improved feature not present in the 270 shaft.

All the above features make themselves felt when running these engines on the dyno. Before actually becoming audible from above, rapping may be heard through the crank case of the GMC. Greater lower end rigidity of the 302 would eliminate even these "deflection" noises under the same conditions of tuning where the 270 would show them.

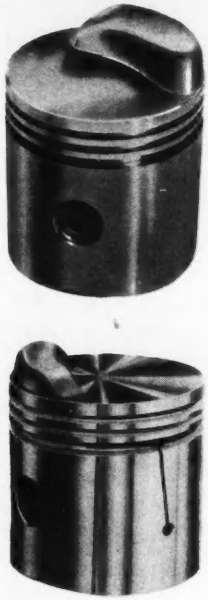
Last month we mentioned the desirability of machined main caps to stand the gaff at #2 and #3 journals. California Bill passed along a good tip that will probably do the trick without the necessity of align boring which the machined caps must have. He uses reinforcement bars of flame-cut steel 1¼ inch square by 4¾ inch long which span the



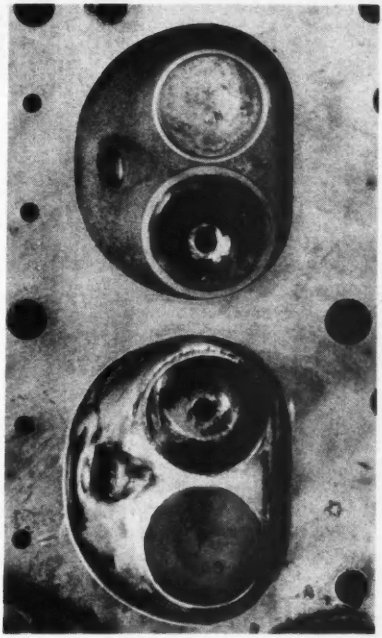
Intake side of Fisher GMC head. Aluminum goodie has been used on record breakers.



Phantom view shows pan modification and pump relationship for adaptation of GMC to car.



Top piston is McGurk Hi-Power slug for competition. Bottom is McGurk road piston.



Stock (top) combustion chamber compared to reworked, ported chamber in 302 head.

altered stock main caps. These are machined flat across the capscrew bosses by lathe or mill so that there is a smooth seat across their entire width to face against the reinforcement bars. Fastening these will require somewhat longer capscrews than stock and Allen head screws are recommended, National Course Thread, of course. *Precaution:* If either piece of this modified cap assembly is distorted when tightened, binding of the main bearings could result. Check the installation with Plastigage to assure yourself that no crushing of the main cap by the reinforcement is occurring.

One more point and we'll get out of the lower end. 228-270 cranks have only four relatively puny flywheel attaching capscrews. Good practice at this point is to drill four extra holes in the 1939 Chev truck flywheel we hope you're using, at locations between the four existing holes. If possible, drill the holes for a close fit on 7/16 inch high-tensile, self locking capscrews to obtain maximum doweling effect. Ford flywheel capscrews are 7/16 NF and have larger shanks than common bolts. If you use these, torque them to at least 70 foot pounds and you'll never lose another flywheel.

Pistons

When we talked about the busy buckets last month we neglected to mention Frank McGurk's contribution to GMC fame.

McGurk furnishes either standard or high compression versions for the 302 in either 4 1/8 inch or 4 3/16 bore sizes. These allow compression ratios of 8.6:1 to 12.1:1 by either piston plus milling or with pistons alone. We like the skirt design of these rugged pistons (almost a slipper) and the weight of the big 4 3/16 inch size is 11 ounces less than the stock item. As the crank is offset in the 302 block, McGurk uses no offset of the pin in these pistons.

(*Continued on next page*)

For use with the 270 head, McGurk furnishes the famous Venolia GMC piston in $3^{15}/_{16}$ inch or 4 inch bore sizes. These have a rounded contour dome which pops up into the 270 head to produce squeeze of from 8.5:1 to 12:1. Recommended clearances of these full skirt jobs is .005 to .008 inch, depending on the degree of break-in.

The Venolia is also furnished for Chevs to accommodate GMC rods and the beefy .990 inch GMC wrist pins. For the Chev, McGurk makes them to order only, in bore sizes of $3^{7}/_{8}$ inch, $3^{21}/_{32}$ inch and $3^{11}/_{16}$ inch.

When fitting pistons be sure to have your block bored to give the clearances recommended by the supplier. Not only does the piston alloy determine what clearance should be used but also the skirt design. The piston manufacturer has undoubtedly found out the hard way what clearances should be used. Again, it is a question of degree and if you are building a competition machine, the high limit clearances are what you will want. A drag strip or a road course are poor places to worry about oil consumption or piston slap.

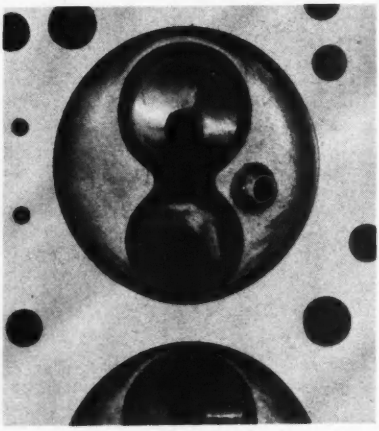
Cylinder Heads—Modified Stock

To illustrate the relationship between the various head and piston combinations, we have taken this sketch from Bill Fisher's GMC manual. These engines are quite unique in our experience for the variations in combustion chamber shapes and available compression ratios. As the chambers are all located directly above the bores, valve sizes are more limited than in some of the offset, squish chambers found in many of the late V8's. Breathing is probably not thereby seriously hindered, but we would like to see a head built for the GMC with the valves inclined about 15 degrees from the vertical. In spite of all our fine theories, however, the Jimmies, like the proverbial bumble bee, just go ahead and fly!

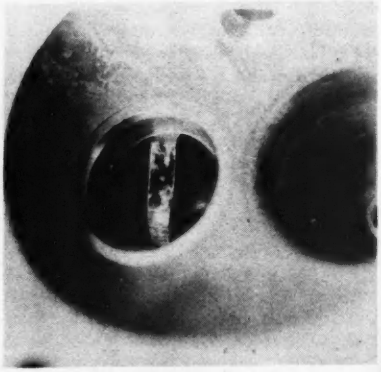
Following our theories a bit further, we think the best stock head modification would be the 302 head with the flat piston. This combination would not attain some of the astronomical CR figures of the pop-up pistons with the 270-H head, but we like the squish area of about $^{3}/_{4}$ inch produced at one edge of the piston. We feel some extensive testing would also find that this setup had a Higher Useful Compression Ratio for a given bore size. HUCR is simply an expression which gives some comparison of Combustion Chamber roughness for various chamber designs. A general rule of thumb which usually applies is that the HUCR will diminish as the bore increases. This is but one of the reasons why we stay conservative on our recommendations for squeeze on the GMC.

The first step in modification of the stock head will be to remove the exhaust seat inserts. This is done by carefully driving them out by a cold chisel inserted through the ex-

(Continued on page 60)

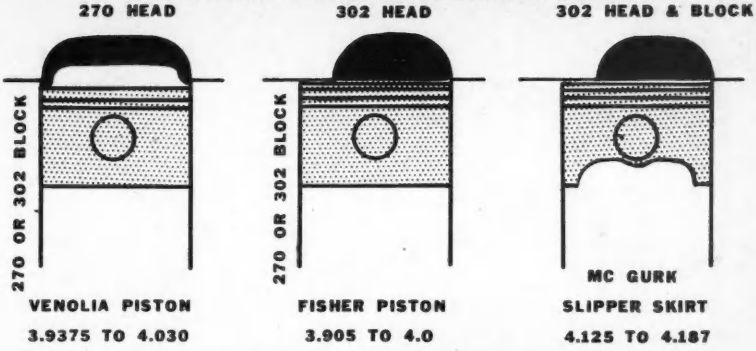


Cast-in valve seat in the Fisher GMC head. Note that the seats are actually one piece.

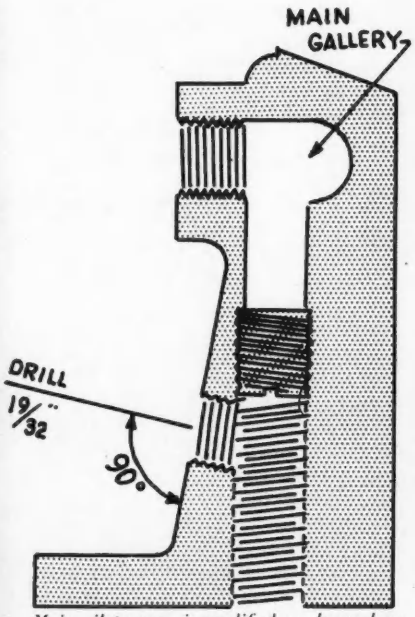


First step in GMC head modification is the removal of the exhaust valve seat inserts.

CYLINDER HEAD & PISTON COMBINATIONS



AVAILABLE SIZE RANGE SHOWN FOR EACH PISTON



Main oil passage is modified as shown here and as explained in text to take full-flow Chrysler oil filter and/or oil cooling unit.

Oil pan must be modified as shown here and on page 12 to clear the steering assembly.

Proximity of steering idler to oil pan is seen here. Note very necessary breather.

BORDER CITY CUSTOM

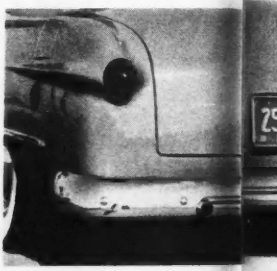
BY DICK DAY

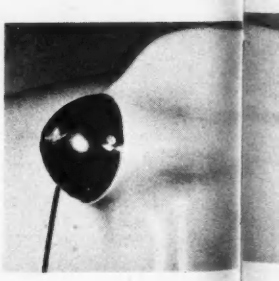
Photos by Bob Hardee

"I always wanted to customize a Ford coupe . . ."

AND ED FAHLSING of San Diego, California is no different than the rest of us. No matter how many customs a guy has had during his enthusiastic years, he has had the itch, at one time or another, to give one of Ford's products the full treatment.

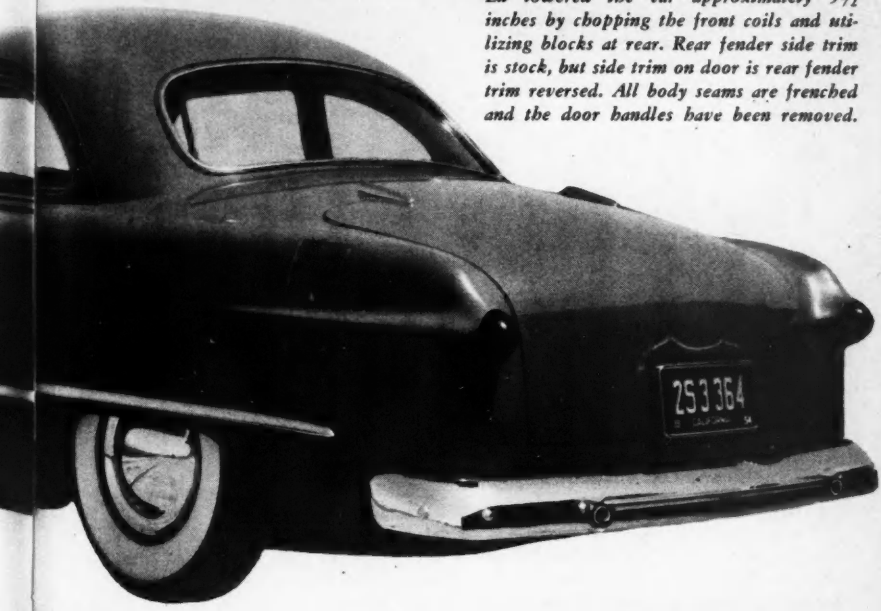
Ed built up a couple of conservative customs from Chrysler's stable while in high school, but wasn't quite satisfied with the finished items. He then purchased the present '50 Ford club coupe and again set to work, working out some fundamental ideas on paper before going ahead with the actual body work. He claims that for customizing, the Ford, due to stock factory styling, offers a better foundation from which to work. Two body shops were chosen to do the metal work, Allen's Body Shop and Nick's Body Paint, both in the same bay area. Six months and $520 later the car was a shining example of just what Ed wanted, and the "I wanted to customize a Ford coupe" bit had become a reality.

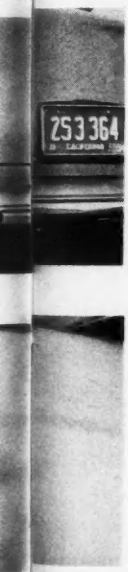


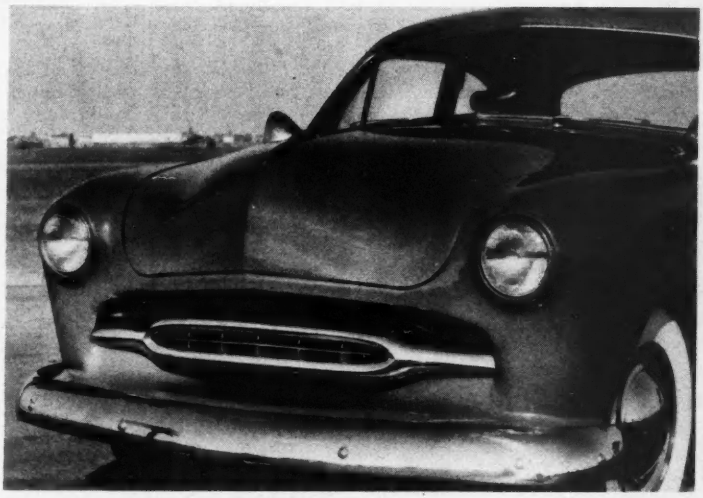


Fender taillight flange has been enlarged to fit flush with '53 Olds lens. Exhaust tips have been built into trimless bumper.

Ed lowered the car approximately 3½ inches by chopping the front coils and utilizing blocks at rear. Rear fender side trim is stock, but side trim on door is rear fender trim reversed. All body seams are frenched and the door handles have been removed.







The front end styling that Fahlsing came up with is simple and very effective. The hood is partially nosed and corners rounded. The headlights have been frenched using stock rings. Grille is moulded in and '54 Pontiac bar installed.

HERE'S HOW

Building a Sportsman Class Modified Stock Car

By Edward Monroe

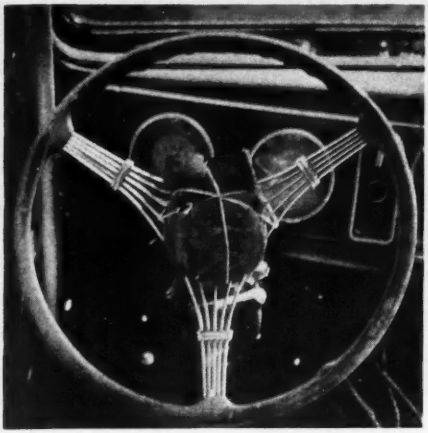
PART II BODY MODIFICATION

WHILE reworking the body three main objectives were kept in mind. They were: 1st, to provide maximum driver protection, 2nd, to keep the weight as low as possible and 3rd, to achieve good weight distribution in as far as this factor could be controlled.

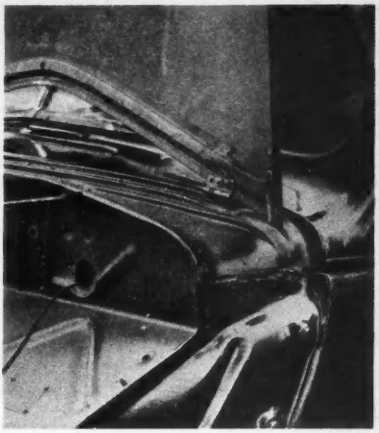
First, the interior of the car was stripped. This meant the removal of the seat, upholstery and all glass except the windshield. Considerable excess weight was eliminated by removing such items as window regulators, glove compartment and its door, the mechanism for opening the cowl vent, the rough jagged metal over the windshield, etc. The emergency brake lever together with its linkage was removed as this could cause injury to the drivers legs in case of an accident, due to its location, and by removing this unnecessary item, some weight was eliminated.

The opening provided for the rear window was enlarged with a cutting torch and the edges rolled. Rolled edges add to the

The car begins to take shape. White patches make for visibility on dusty dirt tracks.



Steering wheel hub is padded with foam rubber which helps to prevent injuries.

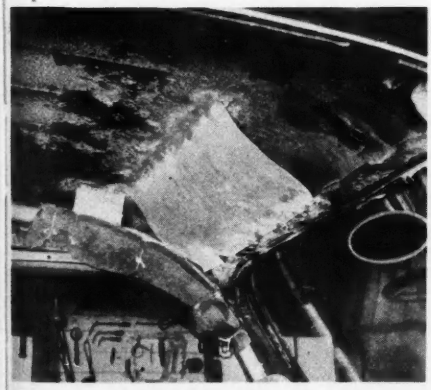


Regular door hinges are used to replace the hood hinges, another saving of extra weight.

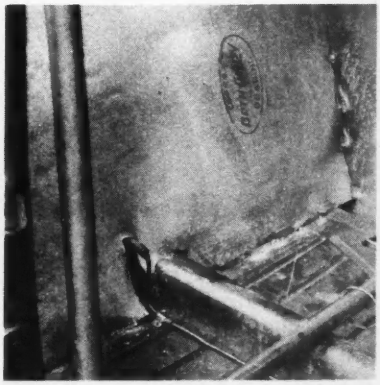
strength and rigidity of the sheet metal and eliminate the danger of cuts and scratches. Enlarging this opening was thought to provide several desirable advantages over the small opening. It would provide another possible means of escape from the car after an accident; it would allow the air which entered the open window to escape readily without being trapped and producing a hold back effect similar to a parachute; it would enable the driver to be better able to observe the location of cars in the rear; and, finally, by removing the extra metal some weight was eliminated.

The approximate shape of the fenders was drawn with soapstone and excess metal cut away with a torch. The fenders were shaped in such a way that there would be little danger of cutting the tires in case they were smashed, to give the least possible wind resistance, and to remove as much weight as possible and still comply with the rules. After trimming, a cloth dressmakers'

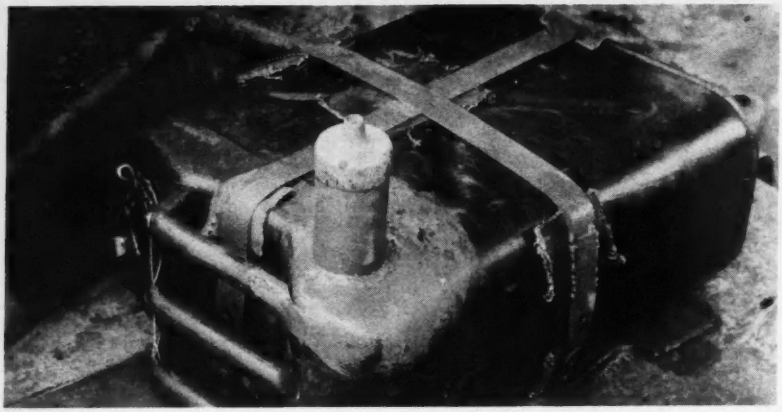
(*Continued on next page*)



Convex, light gauge sheet metal is brazed over windshield for more driver protection.



Galvanized sheet metal is used between driver, fuel tank, forming second firewall.



Fuel tank was made from a five-gallon G.I. Jerican. Neck is part of an old grease gun.

HERE'S HOW continued

tape was stretched along the edge and another more accurate line drawn with soapstone. This line was used as a guide for rolling the edge of the fenders. The rolling was accomplished by bending the edge over with a pair of pliers after which it was smoothed down with a hammer and dolly.

Proper bracing and strengthening of the body is a very important item in the construction of a stock car. Far too often one sees bracing made of old rusty pipe cut so carelessly that there is little area for welding, and with welds of very poor quality. Such bracing is of little, if any, value and may even be a definite hazard should it break loose and fly around in the car in the event of a smash up. Pipe usually has the disadvantage of being excessively heavy.

The main bracing in the Sportsman herein described was made of Chevrolet driveshaft tubing salvaged from junked cars and one piece of channel iron which was bent to the shape of the roof of the car. Chevrolet driveshaft tubing is considerably lighter than pipe, yet very strong and welds very well. The channel iron was welded to the roof, using a number of short welds (see

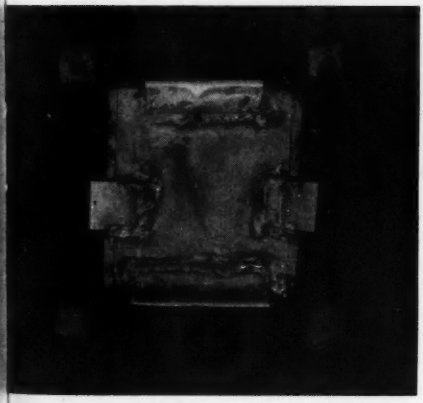
Left-hand door was welded shut, both inside and outside, providing further stiffness.

A cement block was used to keep the top from buckling during the welding of the roll bar.

photo). A heavy piece of iron was laid on the roof to keep the sheet metal roof from warping away from the channel while the welds were being made (see photo). Gussets were used at the corners to increase the strength and rigidity of the assembly and the tubing was welded to the body numerous places. The combined strength of the body and bracing is greater when they are welded together than the combined strength of body and bracing when not welded.

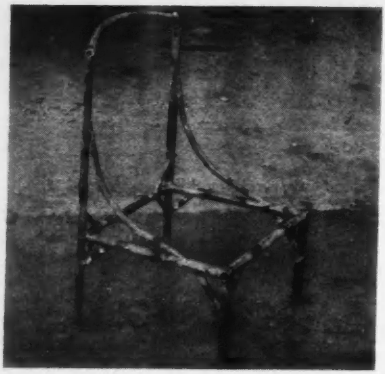
The body was further strengthened by welding the left door to the body. This was

(*Continued on next page*)



After trimming down the fenders, a bead is bent into raw edges with a pair of pliers.

Reinforced sheet aluminum on a tubing frame forms base of seat (see next page).



Seat frame was made up from surplus steel tubing, forming a light but sturdy bucket.

HERE'S HOW continued

welded inside and out. By welding both sides, it made a sort of box section of the joints and added to their strength.

A piece of twenty gauge sheet metal was rolled slightly and brazed to the space above the windshield as shown. The purpose of this piece of sheet metal being to protect the driver's head in the event that he should be thrown against this section. The sheet metal being light and rolled outward will give on impact and yet a helmet will not stick on it as it might on rubber padding so often used at this point.

Two round pads made of a firm type of sponge rubber were tied over the center of the steering column. Pads of the same material were tied to the column itself and to

Canvas was laced to frame to form back of seat. Safety belt hooks to roll bar base.

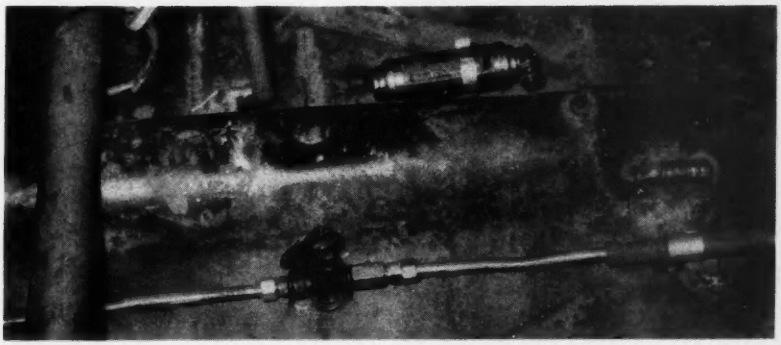
the bracing over the door. The sponge rubber used for padding was taken from the rear seat arm rests on junked cars.

The safety belt was attached to the tubing which forms the lower cross bracing.

The framework for the seat was made from pieces of thin-wall chrome molly tubing salvaged from a wrecked aeroplane. Bending the tubing where necessary was accomplished without wrinkles by filling the tube with dry sand and plugging the ends. It was then heated with a welding torch, using a slightly carbonizing flame. When hot, it was shaped over a piece of large diameter pipe. All joints were gas welded. Pads made of $\frac{1}{4}$-inch steel plate were welded to the bottom of the legs. The seat was made from scraps of 18 gauge aluminum

(Continued on page 61)

Roll bar is strongly gusseted at each corner. Top of bar is channel, welded to roof.



Fuel line runs along drive shaft tunnel next to driver. Note position of shut-off valve.

Base of roll bar is gusseted in three directions and braced with a cross bar near floor.

ROLLS and PLEATS Made Easy

PART II AIRFOAM SEATS

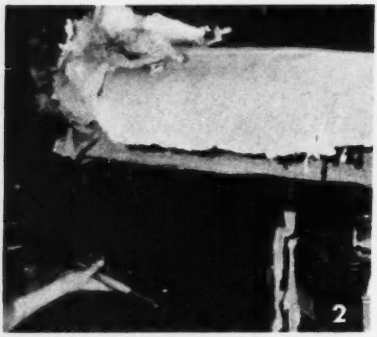
by Bob Greene

LAST month we gave you the dope, or rather the apprentice approach to rolls and pleats the easy way by starting off with the simple upholstery methods for kick paneling or quarter panels. This month we're right back again (and hope you are too) with rolls and pleats for your little jewel's seat cushions. If you made it through the first session without any hassles, then the seats should be no different, maybe a little more scissor work in cutting and fitting, but basically the same.

Next month will put the finishing touches to this three part series, the HEADLINER . . . hang on, we'll have you in a set of plush-buckets yet.

(Work done at Scott's Top Shop, San Diego, Calif.)

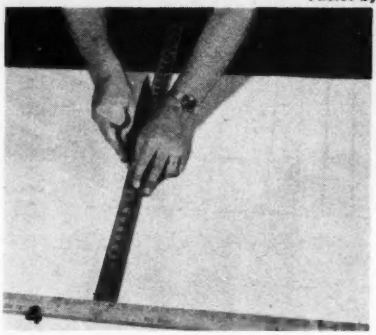
Cushion width may need shortening to clear door panels with doors closed. Allow clearance for thickness that padding will make.



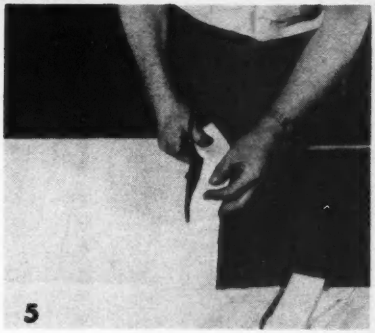
Broken springs can be clipped together or welded. Welding can be done if a wet rag is used to shield padding from torch flames.

Seat is measured for approximate length of pleats to be made. Rear of seat is to be pleated, the front will have generous roll.

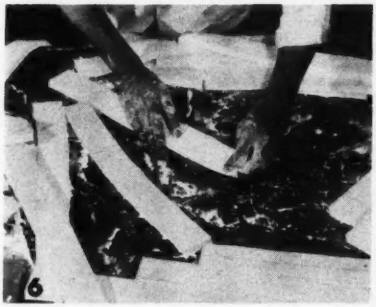
Photos by Bob D'Olivo



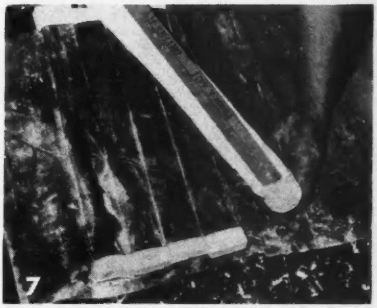
Sponge rubber is marked off for length and width of pleat strips. Pleat width sewn in Naugahyde covering should be narrower.



Rubber strips are cut. If expense is big item, other quality cotton or wool padding may be substituted. Sponge rubber fills tighter.

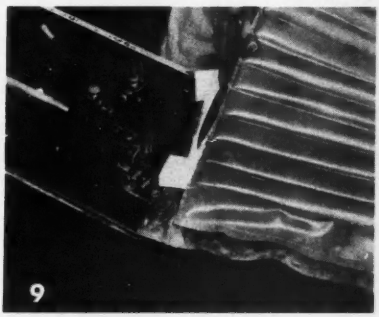


Strips are covered with corn starch so that they will slip easily into pleated material, and therein lies a neat little trick . . .



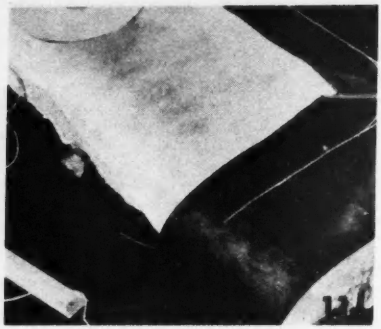
Loader is a fabric strip with long tail and capped head. Rubber is stuffed into head, a long ruler in behind it, then shoved up pleat.

Making of pleats was covered in door panel article last month. Seat pleats use same steps. After stuffing, the ends are sewn.

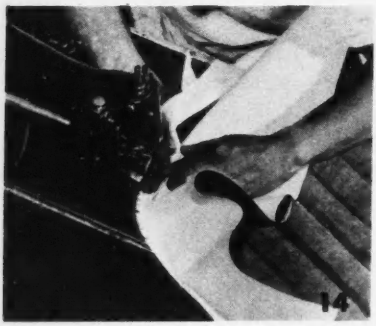


Surplus rubber strips are then cut off flush prior to next step. Backing material beneath Naugahyde is tough but flexible.

Radius on corners of pleated section is marked off with aid of round template. This is front where pleats join the rolled piece.



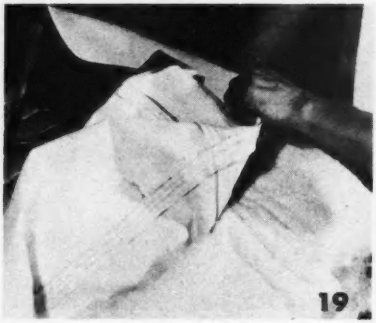
Material for rolled section is measured, cut and sewn. Radius corner is then duplicated with a chalk line to match that of pleats.



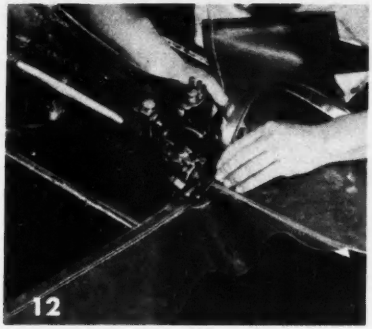
Tie-down loop, a piece of material folded double, is sewn in to form a continuous loop around seat roll and pleat separation line.

On the back edge of the pleated panel a good quality, tough material is sewn. This is behind the seat bottom, will not show.

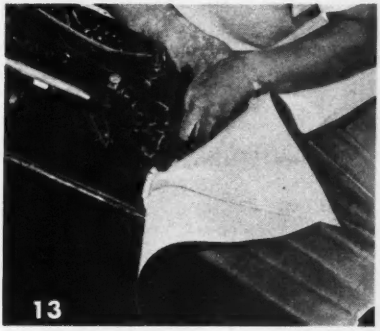
Stranded wire is then fed through tie-down loop that has just been sewn to seat covering. Two wires will then be tied together.



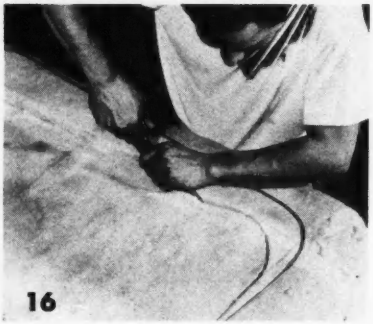
Covering is laid over seat and rolled edge is built up with cotton batting. Tie-down wire is pulled down and tied from beneath.



Welt strip is sewn along edge that will separate pleats and roll. This is top section of roll. Sides are yet to be sewn onto this.



Leading edge (roll panel) is sewn on pleated panel. The welt or bead is sandwiched in between. Material is notched on corner.



A steel wire is shaped to contour of separation line, will serve as anchor for tie-down loop. Seat padding is then cut through.

Heavy wire is stapled to seat structure beneath. This is the gimmick that gives separation between the rolls and the pleats.

Finally, the surplus material on each side is pulled tight beneath the seat base and tacked (in this case) or clipped securely.

These pleats are about two inches wide, a practical, nice appearing size. Thickness of roll is usually higher than the pleats.

NEXT MONTH:
HEADLINER

Torrid Topolino

Photos by Day and D'Olivo

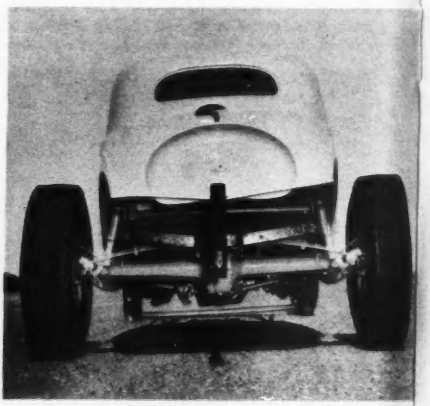
A "MOUSE" BECOMES A BEAR

ONE OF the most successful combinations for dragging is the so-called rail job or dragster, this being, generally, an open cockpit goodie closely approaching the race car in appearance. The only difference between the track job and the dragster in most circumstances is the fore and aft weight ratio, the dragster having a good 70 to 75 percent of the weight on the rear wheels.

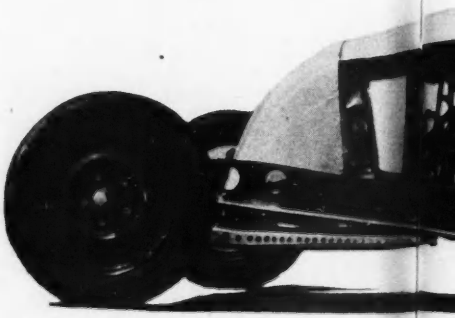
This is all well and good, but what if you want to run a coupe? The construction of most coupe bodies dictates a weight distribution of, at most, 60 percent of the weight on the rear wheels if the driver is not to find himself sitting somewhere under the deck lid. One answer is to stuff the engine in the rear and the driver in the front. The other is to find some sort of body that will set comfortably over the rear axle. Some builders have found the American Bantam or Austin coupe to be practical in this respect. However, the Bantam has one big difficulty; the flat, vertical back end creates a terrific air drag at competition speeds. Also, the supply is limited.

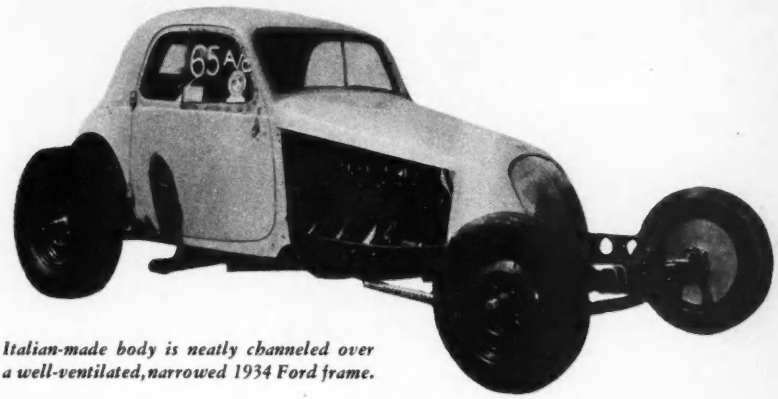
Jim Nelson, of Venice, California, has come up with another answer—the Fiat "Topolino" or "Mouse" body. The Mouse is an interesting car. The chassis parts make fine components for 500 cc race cars (CCM—Nov. & Dec., 1954) and now, it seems, the bodies make for fine drag machinery.

As can be seen from the pictures, Jim's draggin' coupe does not suffer from the major fault of the Austin, having a modified "fast back." Also, the Mouse body need not be chopped or otherwise butchered, being small enough to be comfortably channeled over a set of narrowed rails and set neatly between the rear wheels. Jim, currently a member of the Fresno Rodbenders and an old hand at hot rodding with experience dating back to the early days at Muroc dry lake where he ran with the SCTA Pacemakers, was quick to see the possibilities.



Rear end of Nelson coupe is '34 but is equipped with '36 axle shafts. Note push bar.

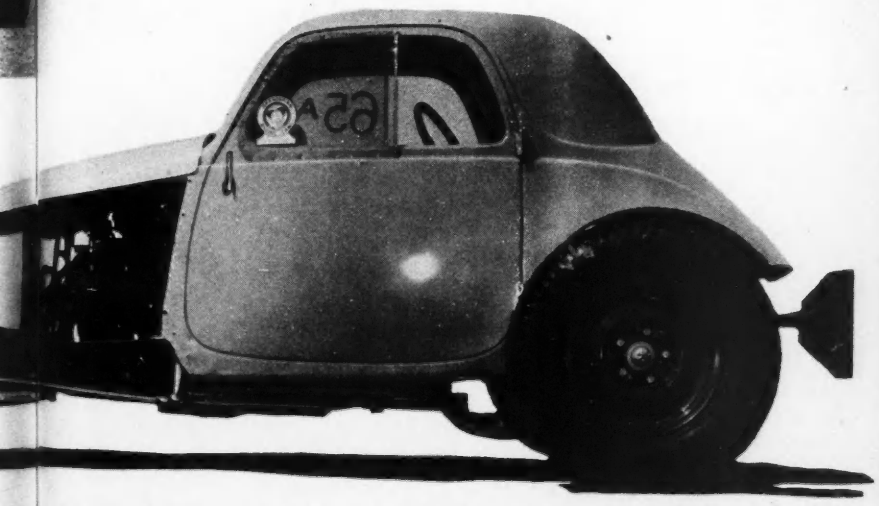




Italian-made body is neatly channeled over a well-ventilated, narrowed 1934 Ford frame.

Believe it or not, the original cost of the Mouse was a mere five bucks. Starting with the five dollar body, Jim went at it the simple way, the method that always proves best in the long run. He latched onto a set of 1934 Ford rails and narrowed them 10 inches, using a channel front cross member and a cut down rear member. The center cross member was made up of Shelby steel tubing, 1½ inches in diameter. This gave him a stock wheelbase of 112 inches and the standard front tread of 54 inches. Use of a '34 rear axle housing with '36 axle shafts gave him a stock 58-inch rear tread, more than sufficient to prevent squirreling under acceleration. Gear ratio is 4.11, a stock Ford gear set.

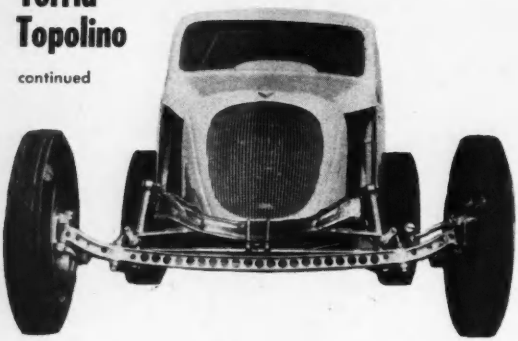
(Continued on next page)



General outline of car follows "Topolino" line, with everything pushed toward the rear.

Torrid Topolino

continued



Front view shows clean lines of Nelson's draggin' coupe.

(*Continued from preceding page*)

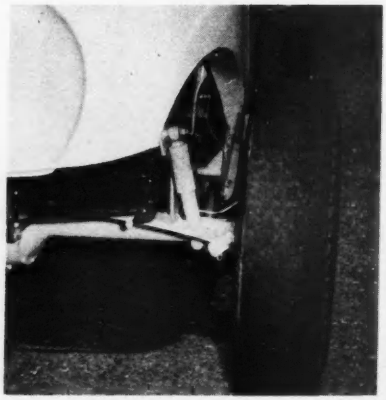
Spindles, front hubs and steering are all '34, but the full hydraulic brakes were taken from a '41 Ford, as were the rear hubs. Firestone 7.00-16 Ascot slicks are used on the end and the front boots are 5.50-16. Delco tube shocks are used all the way around, ratios being 50/50 on the rear and 70/30 on the front.

Well back in the chassis Jim set a big, healthy 296 cubic inch Merc, the basis of which was a '46, 59-A block bored out to 3 11/16 and stroked to 4 1/8 inches. Zephyr valve springs are used with stock size 1 3/8-inch valves. An Iskenderian 404 cam is used. Intake valves open 20 degrees BTDC and close 62 degrees ABDC, exhausts open 62 degrees BBDC and close 20 degrees ATDC. Tappets for this hefty cam are Iskenderian radius goodies. Edelbrock R type pistons are set with a .015-inch clearance. The ports were only cleaned, not hogged out to fist size.

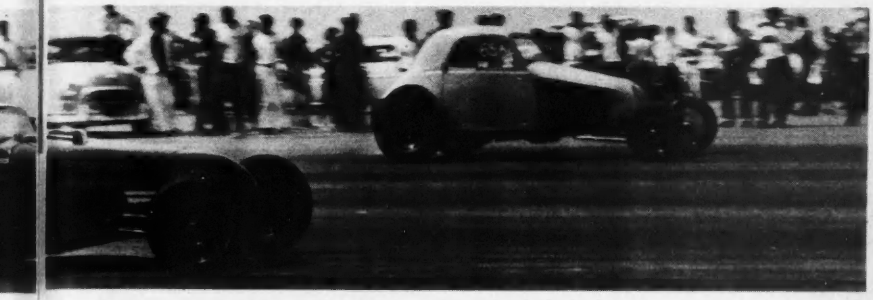
On the external side, the goodies include Edelbrock heads, Sharp four-carburetor manifold, a Harman-Collins magneto set at 20 degrees advance and a set of homemade headers. Fuel used is a 50/50 mixture of methanol and nitromethane. All this pressure is delivered through a *stock* flywheel and 10-inch Chrysler clutch to a '34 Ford gearbox.

After all the chassis parts were stuffed together, the Topolino body was channeled over the rails to a depth of six inches. The original firewall was cut away and replaced with a flat aluminum wall. The neat Fiat grille was used and the space between nose and body covered by an aluminum hood curved to fit the body contour. Floorboards were also made of aluminum sheet which follows the upward curvature of the rail kick-ups. The seat is a mere depression in this portion of the flooring. The firewall is held in by three bolts, allowing for quick access to engine, transmission and clutch.

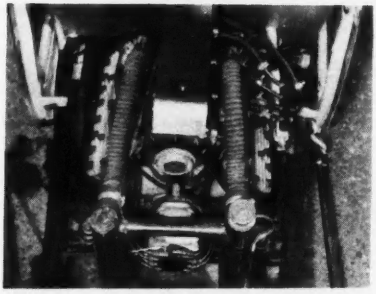
However, it is results that tell the story. Top quarter-mile speed to date is 129.95. Not bad for a Topolino. In fact you might say that here was a mouse that studied hard to be a bear and made it.



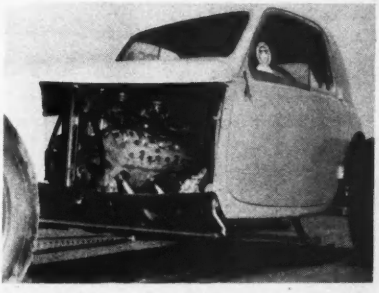
Rear suspension of coupe follows Ford practice. Rear tires are Firestone Ascot slicks.



Nelson tears off line at San Diego against Austin-bodied coupe. Austin won narrowly.

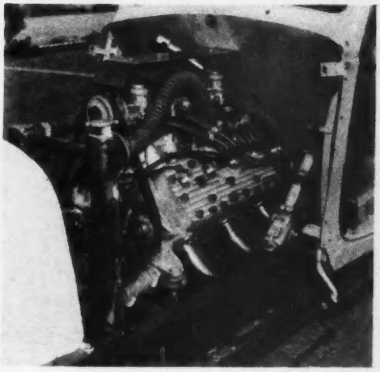


Coupe uses no radiator, transfer tubes holding sufficient coolant for the short drags.

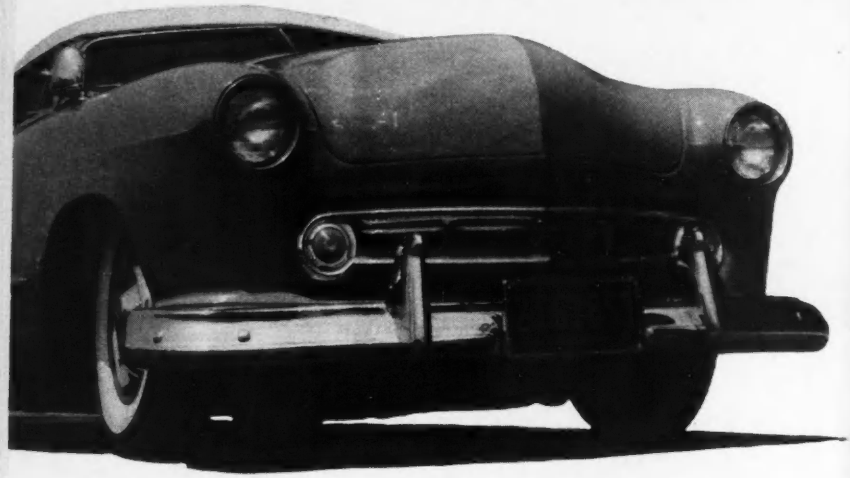


Potent Merc engine is bored and stroked to 296 cubic inches, uses Iskenderian 404 cam.

Depression (right) in aluminum floor forms seat. Firewall can be removed in minutes.

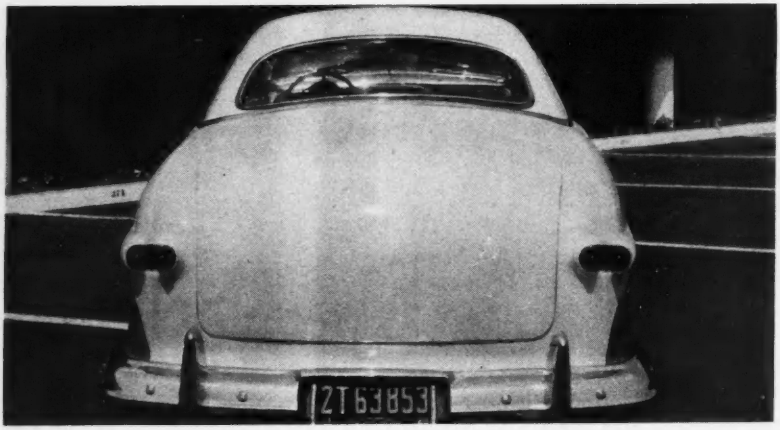


Heads on big Merc are Edelbrock, manifold is Sharp, the magneto is a Harman & Collins.



Hood corners have been rounded and center peaked. Grille paneling has been moulded into opening and special floating type grille built from '53 Dodge components. '52 Ford headlight rims were used to french headlights. Note side styling peak on fenders.

LOW



Trunk trim has been removed and hinges mounted inside compartment. The bumper has been split at center and license plate recessed into it. Bumper has been notched for horizontal exhaust tips. Car has been lowered a full 6 inches in rear and 4 inches in front.

A SMASH-UP can be, and usually is, a heart-breaking thing. Nobody likes to see a good piece of machinery all tangled up or wrapped around a utility pole. Let's just say that Arkansas-born Jay Johnston, now of Los Angeles, California, was covered with luck as well as ingenuity.

Jay had just bought himself a near-new '49 Ford. By subtracting a bit here and adding a bit there, he was well on his way toward a very sanitary set of wheels. Then it happened. The wreck totaled the car. As we said, Jay was lucky; the car was in far worse shape than he was. Jay bought the car back from the insurance company and set to work to see what could be salvaged.

Then began a series of treks to body shops, wrecking yards, Ford dealers and anybody who might be in a position to supply parts. By a process of shrewd trading, Jay managed to use almost all of the bent-up Ford parts as barter material to get the new bits and pieces he needed.

Just to give you an idea, he bought a new convertible chassis for a starter. Then a used convertible body was procured, from a bargain sale of course. After this came a '51 Merc engine and running gear.

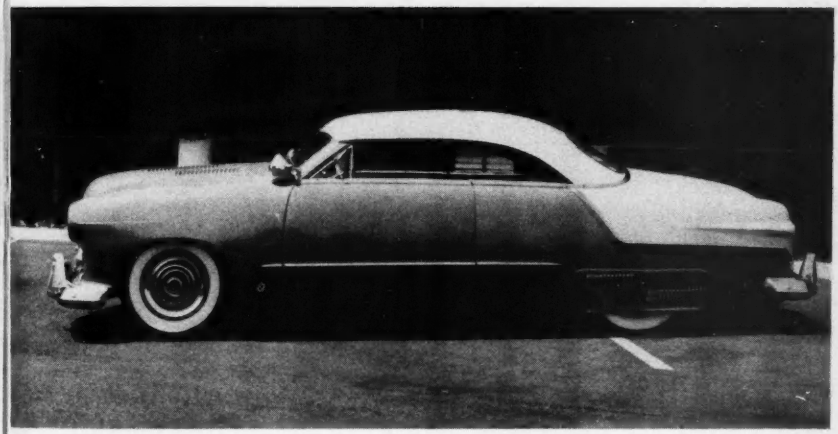
What evolved, after two years of work by Jay and his buddy, Bill Bowman, was a home-built hardtop Victoria, a standard coupe top being reworked to fit the convertible body. Upholstery was done by Gaylord and electric door latches fitted.

Although radically lowered, the car does not bottom except on severe dips. The rear end lowered was done by "C-ing" and the front drop accomplished by moving the A-arms upward and shortening the front springs. By keeping the arms parallel as in the stock Ford, Jay did not destroy his front end geometry in the dropping process.

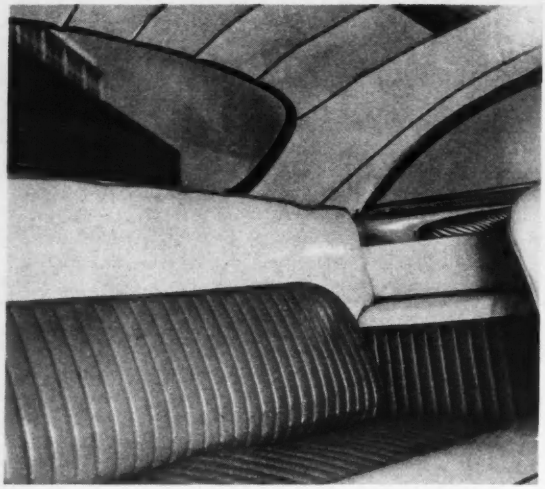
As we said, a wreck can be rough stuff, but if you use a little ingenuity, you just might be able to come out of it smelling sweet as a rose.

WITH A RADICAL TOUCH

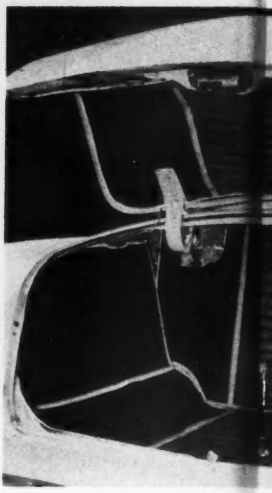
Photos by Bob D'Olivo



Relationship of top to body and novel two-tone paint job gives sleek styling appearance. Top originally is from stock two-door, but has been backed 4½ in. with center posts removed and windshield and back re-sloped to simulate popular Victoria style.



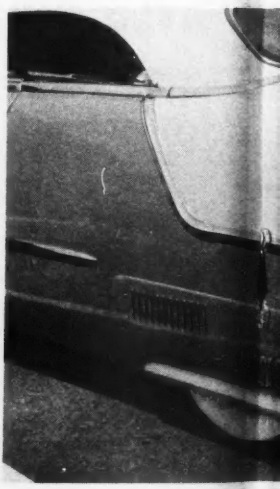
Rear seats were completely reconstructed from plywood paneling, rubberized horsehair and Airfoam rubber.



Trunk has had the full treat all paneling and a center sect

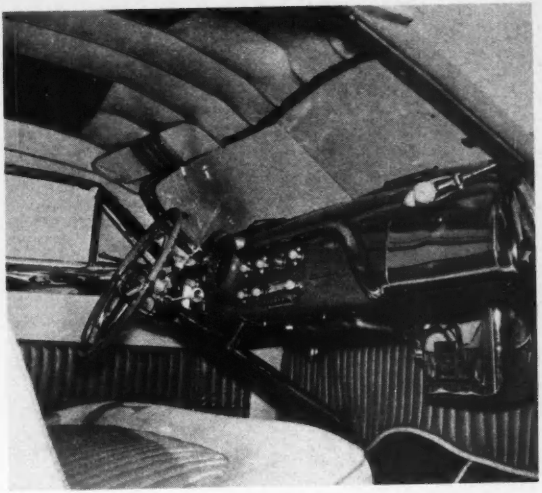
LOW WITH A RADICAL TOUCH continued

All body seams have been filled. Stock taillight openings had to be enlarged to accommodate '51 Buick lens.

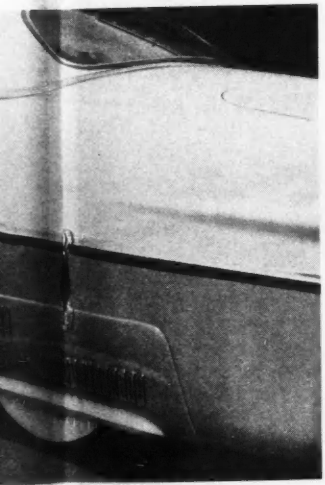


Chrome trim dividing two-tone Skirts have been louvered and

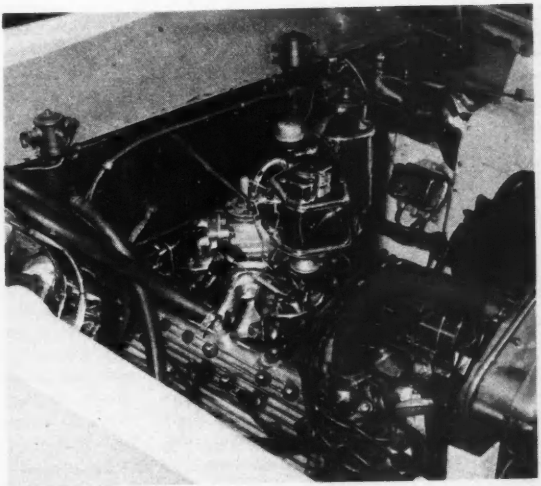
full treatment. Dark carpeting for enter section of pleated Naugahide.



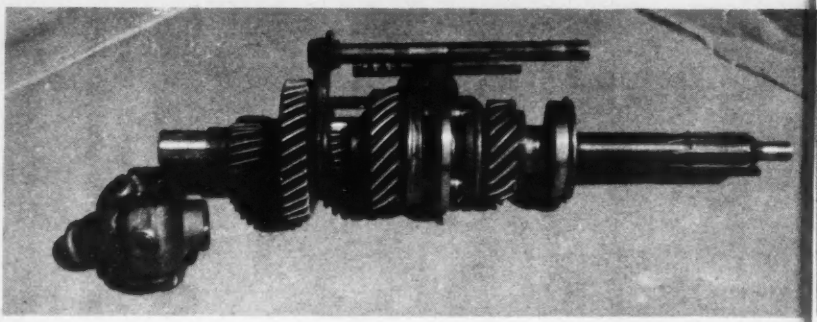
All trim such as dash, steering and window frames are chrome. Complete upholstery is rolled and pleated motif.



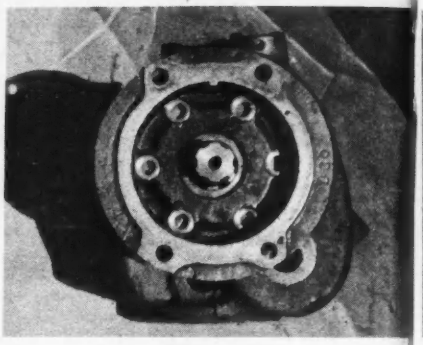
g two-tone paint job is from '53 Olds. uvered and each louver is chromed.



Powerplant is warmed over '51 Merc. Running gear is also '51 Mercury featuring a Merc-o-matic transmission.



Caddie gear train without cluster gear but with shift forks and rails. Note width of gears and beefy 2nd-3rd gear synchronizer.



Rear view of modified case showing output shaft and bearing retainer in place. The '36 Ford rear transmission mounts fits here.

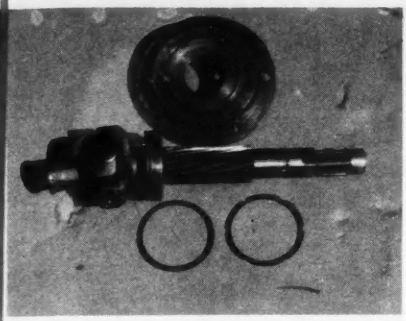
Don't send a mouse to do a man's job!

BIG GEARS for

A REMARKABLE example of mental blinders worn by the average souping artist is his tendency to use only what has been used before by others. Nowhere is this blindness more evident than in the use of the Ford passenger gearbox, vintage early '30's through 1954. Lest this sound like treason from a Ford fan, let me hasten to add that we think there is nothing wrong with the box, only its application. Many highly-touted goin' machines have been built around these boxes, with success if the chassis was light and with failure if the engine was a potent torquer in a ton-and-a-half chassis. Savvy soupers eagerly latched onto the Zephyr gears in an attempt to stretch out the wind and many adapters are still sold to button these boxes onto warm Cads or GMC's.

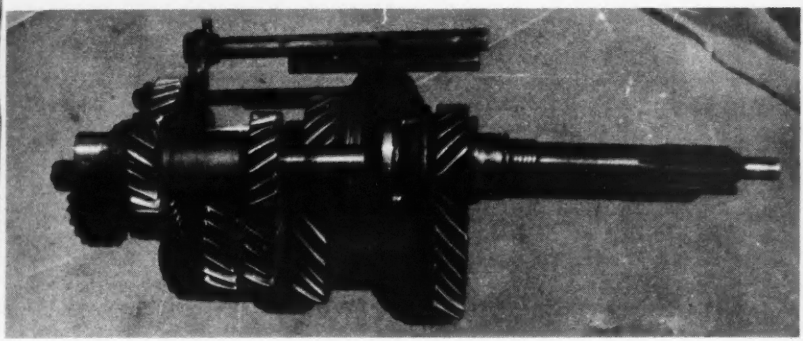
Why a Gearbox?

As any transmission is put into the drive train to multiply torque, these box ratios are every bit as important as the rear axle ratios. In fact, multiply the *gearbox ratios* by the



Chopped tail-shaft, complete with rear bearing and Ford universal, is shown with Ford bearing retainer, modified (notched) ring.

Here's the whole layout, including cluster and reverse idler. New output shaft is at left. Shift rails and forks are at the top.



By Chuck Eddy

BIG ENGINES

rear axle ratio and you get *overall ratios.* These figures are usually expressed in European writings but too seldom on this side of the pond. What overall ratios accomplish is an expression of how fast the engine must turn in each gear to produce a given road speed. This is also of considerable importance to the engine since the *spread* of these ratios may be so wide that the engine drops out of a favorable torque range in shifting from a lower to higher gear in the transmission. As we are blessed (or cursed) with normally ample engines, we are able to do fairly well in the family bus with a three-speed, wide-spread ratio gearbox. Bottom gear (1st) is there to start the car moving through 15-30 mph, intermediate (2nd) to accelerate 30-60 mph or climb hills, and top gear (3rd) for cruising. The ratio between gears in most boxes of this type will be in the neighborhood of 1.6:1 between 3rd and 2nd and 1.7-1.8:1 between 2nd and 1st. To illustrate this function let's check out an actual example with

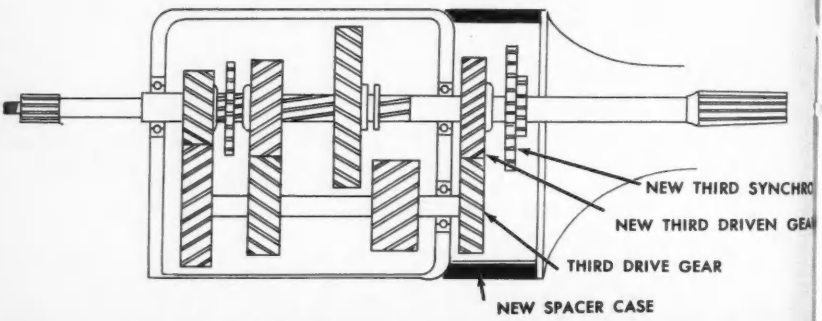
Old Caddie tailshaft at top was cut and resplined, bottom, by Cook Machine, Los Angeles.

BIG GEARS for BIG ENGINES continued

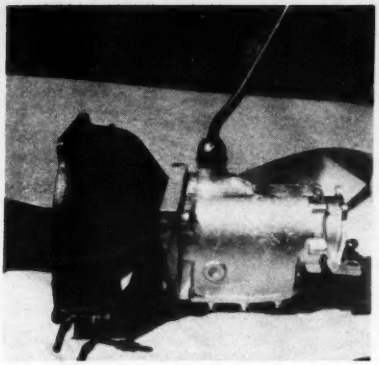
a late Ford box and 3.9:1 rear axle and 6.70 x 15 tires. These tires make about 745 turns per mile. At 60 mph that means they would be rotating 745 rpm, okay? Multiply this 745 times the rear axle ratio to find the engine rpm in High at 60 mph. My slipstick says about 2900 rpm. Now, to find what we would have to wind to go that fast in 2nd and 1st gears, we multiply this figure times the ratios in the transmission in 2nd and 1st.

In the Ford 2nd gear, we would have 2900 times 1.62=4700 rpm. In Low gear, we would have 2900 times 2.78=a fast 8000 rpm! Obviously, it would require a tremendously versatile engine to perform well under such a tremendous range of rpm and in normal driving we wouldn't ask it to do it. Racing is different and the greater the speed range on a given course, the more we need ratios to allow our engine to operate nearer its *happiest* rpm range.

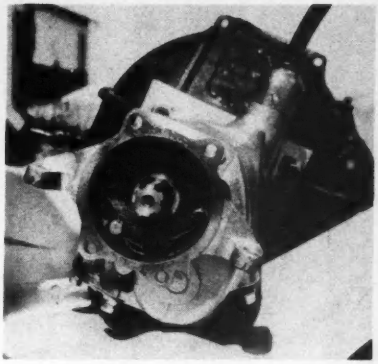
More ratios are used on the more expensive rigs and if more gears are used, the steps between each are *closer*. Thus, a well designed racing gear box of four speeds might have the *top three gears* separated by multiples of only 1.2, instead of 1.6 or 1.5 of the average U.S. three-speed. Fittingly, this would be termed a *close ratio* box. We're sorry we can't tell you that the 1939 Persper Eight used a close-ratio, four speed box, with beefy synchronizers on the top three notches and that the junk yards are full of 'em. No, but we will tell you that the junk yards do have some unmined gold in the form of some rugged three-speed transmissions with ratios as close as 26 tooth Zephyr gears. Not only are they adequate torque-wise, but the strain on the lettuce



Schematic diagram shows how gearbox might be converted to 4-speed unit with new gears.



California Bill adaptation of '37 Cadillac box to Chev-GMC housing with "plank."



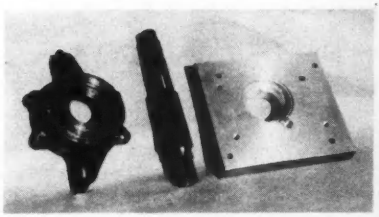
Here's C. B.'s adaptation from rear showing how '36 Ford transmission mount is used.

basket is a slight $15-$25. Too good to be true? Don't stop reading now!

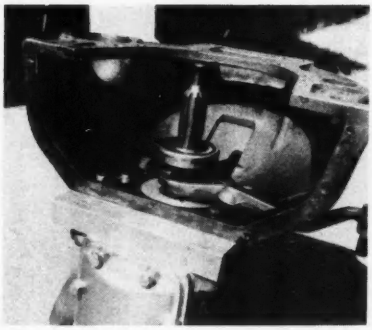
Pandora's Box?

In 1937, when Caddys were still sold with mixing sticks instead of mixmasters, some engineer-benefactor decided to build in a durable and smooth shifting transmission. The same basic box appeared with the column shift gimmick in later Cads and Olds. This box employs the following ratios: High, 1:1; 2nd, 1.52:1; 1st 2.4:1. These are al-

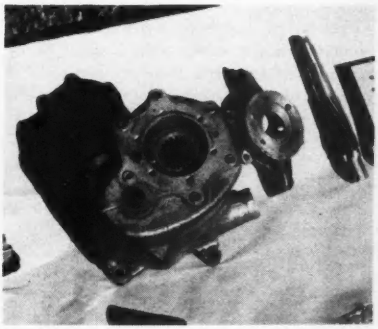
(*Continued on page 65*)



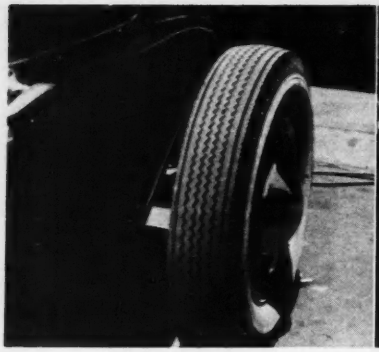
Here are the three parts necessary to fit Cad box to GMC for use in Ford chassis.



Bottom view shows clutch release bearing and lever. Housing is GMC used by Fisher.



End view shows how original attachment holes are plugged and small bolt circle cut.



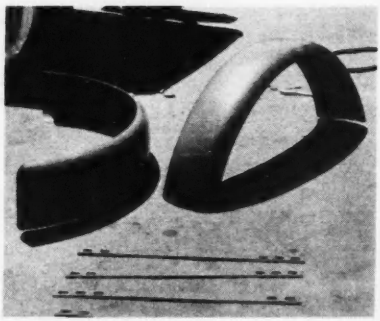
FENDERS ARE EASY!

If the law says fenders are the most, here's the way to do the job

Photos by Sinclair Wolfson

THE PROBLEM of how to comply with the fender laws of many states, particularly on your newly channeled roadster or coupe, can be a vexing one. Front fenders on such cars can be mounted in a multitude of ways, either to the frame in the manner of the Allard, or to the backing plate. If at all possible, it is best to mount the fender to the frame, making it part of the sprung weight of the car—it's subject to less vibration stress that way.

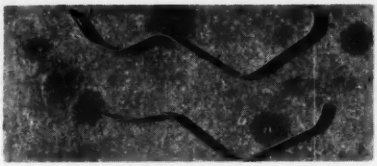
Rear fenders, however, pose more of a problem, particularly if, in the case of a radical channel job, the original rattlers can't be bobbed to fit the new contours. Here's a method of using the cycle-type guards on the rear and still keeping them as part of the sprung weight.



1. Here's the kit as it comes from the auto supply store: two fenders and four braces.

2. First step consists of aligning fender. Make sure that room is left for wheel travel.

3. After checking brace location, bend each strap to fit into contour of fender well.



4. Braces should look like these when finished. Trim excess metal from undrilled end.

5. Using brace as template, mark and punch for drilling locating holes in fender well.

6. Using drill bit of same size as hole in brace, drill into well at marked positions.

7. Install brace in fender well, using bolts supplied with kit. Check clearance again.

8. Place fender on mounted braces and drill through both, then bolt fender to braces.

9. Here's the finished job, light and clean with enough clearance to allow wheel bounce.

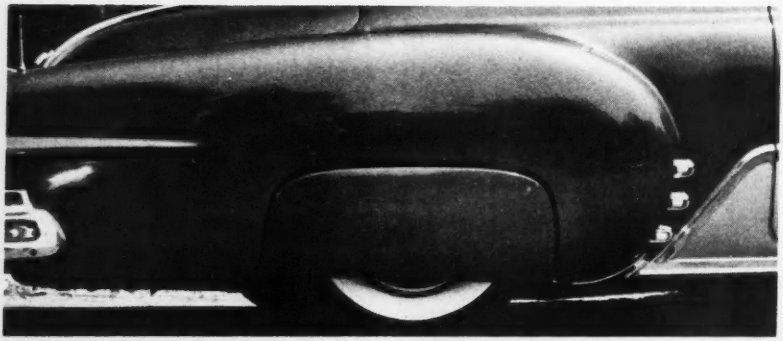
TORCH TIPS

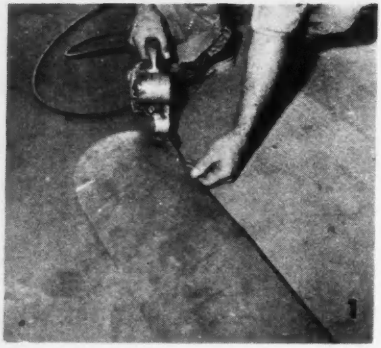
By Dick Day

Photos by George Barris

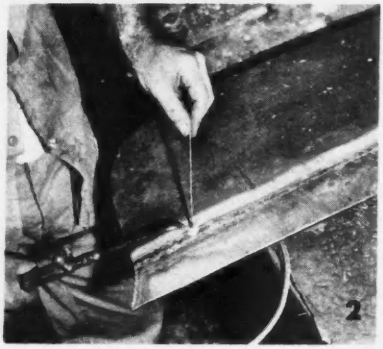
FILLING IN FENDER SKIRTS

THIS month we're again back to lowering, but not in the common fashion known to most customizers as with lowering blocks and chopped coils. Instead, it's more on the sanitary side, an optical illusion you might say, or just plain cheating. Most of Ford's and GM's rear fender skirts are so designed that they do not meet, or flush off, with the lower body line of the car. When this skirt opening is filled, the car takes on a 2 to 3 inch lower look. Coupled with lowering blocks, you'll really have a low appearance.

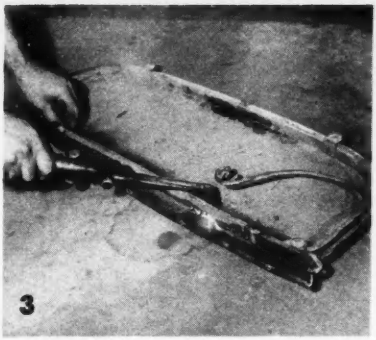




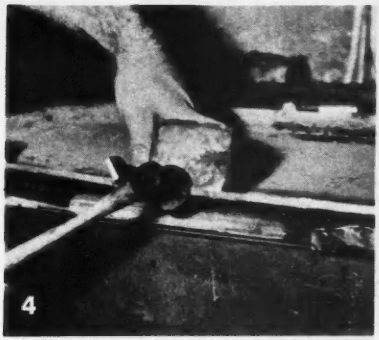
First step is to determine area to be filled. Then transfer to 18 gauge sheet metal.



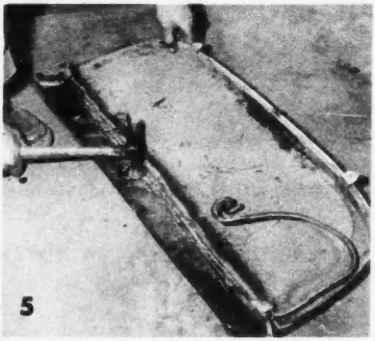
After cutting the sheet metal filler for the skirt, weld it solidly into its position.



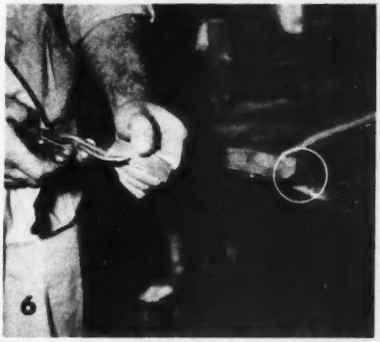
With filler welded in place, turn the skirt over and cut out center section of flange.



With dolly and hammer roll the edge of the filler section for safety and appearance.



Now work out all the low spots and warped areas with a picking block and hammer.



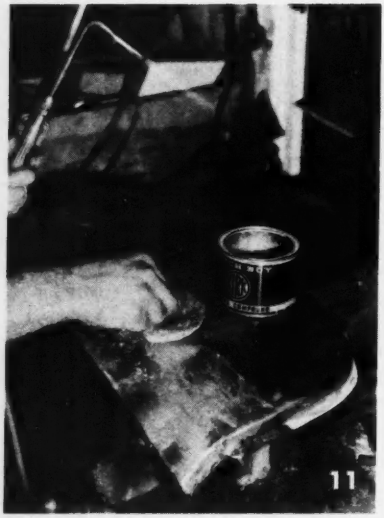
At each end of the skirt you will find two small openings, cut filler pieces for these.

After cutting and fitting small end pieces, tack weld into position, then weld solid.

With the skirt in a completed but rough stage, fit it to fender for alignment

Grind working area smooth with an electric grinder set up with a 24 closed grit disc.

Continue cleaning welds and the working area with rotary brush and hand drill.

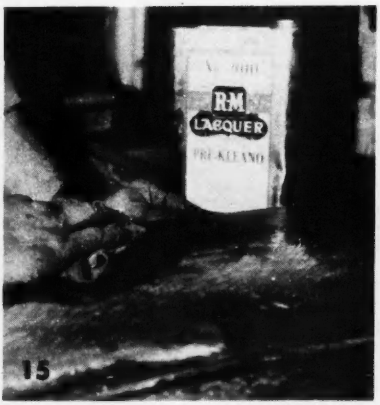


With torch heat and a steel wool pad, apply tinning compound to the working area.

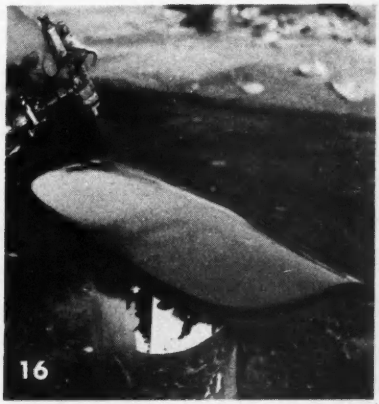
After area is completely tinned, start applying lead by heating with low torch flame.

Lead is then filed to the correct contour and worked smooth with a vixen file.

Area should now be sanded and feather-edged with sheet of 220 wet and dry paper.

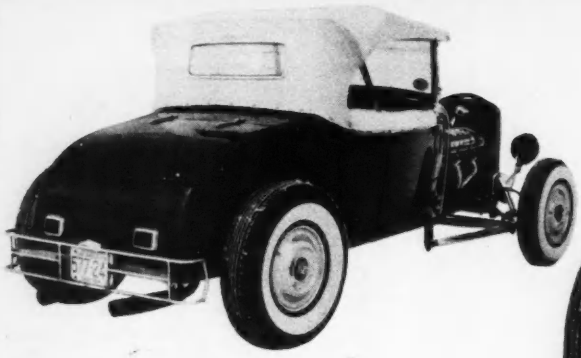


With the working area completely smooth, clean skirt surface with metal prep solution.



To finish, prime, block and surface with number 180 paper, then apply finish paint.

NEXT MONTH: BUMPER-TIP EXHAUSTS



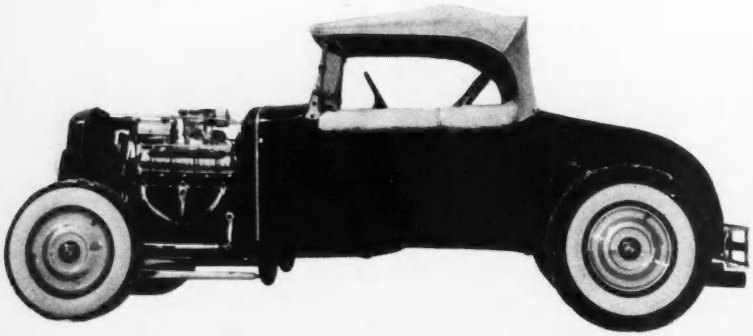
Neat, stock top looks good despite channel job on the car.

COVINGTON

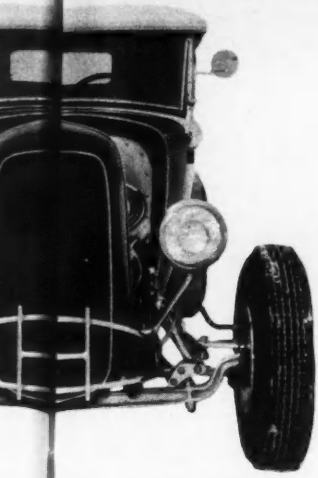
QUITE often when a guy sets out to build a hot rod, all he knows is that he wants a hot rod. Then begins a long process of trial and error. Sometimes the result is not up to expectations, other times it's better. Most often, though, it's a long, hard row before the final result can really be called "hot rod," and with pride.

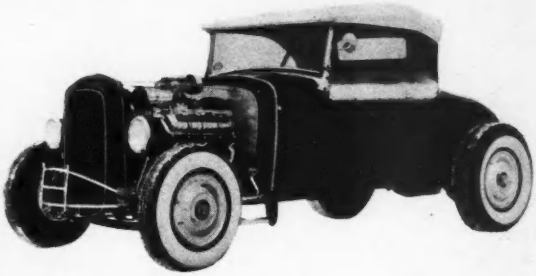
Not so with Don Conrad, of Covington, Kentucky. Not so long ago Don was in the navy and his ship was stationed in Long Beach, California. Long Beach is known as the hottest spot in one of hot rodding's hottest areas, so Don was indoctrinated right, with a wealth of material to study.

On discharge, Don went back to Coving-



Side view of A-V8 shows almost classic design that has come to mean one thing—hot rod.





Windshield is also of stock height, providing good vision.

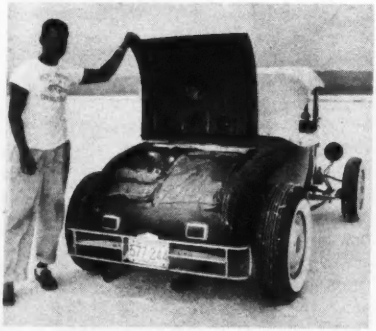
N ROCKET

PHOTOS BY PETE

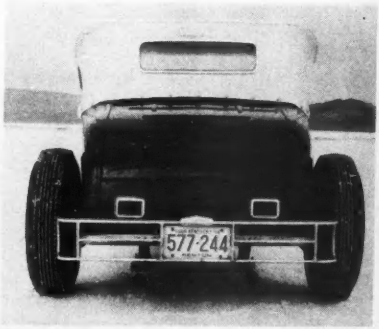
ton with the kind of yen that can only result in one thing, a good roadster. After a short search, he came upon a '31 Model A roadster in pretty fair shape. Pulling the body off the frame and discarding the A-bone engine, he set to work.

The '31 cross member was pulled out and a sturdier unit from a '41 Ford was stuffed in its place. The rear axle was left stock with its 3.78 to 1 gears. The A transmission was pulled and replaced with a '41 Ford box fitted with Lincoln Zephyr gears and set up for a column shift. A shortened '32 Ford steering column and sector box was used in place of the '31 set-up.

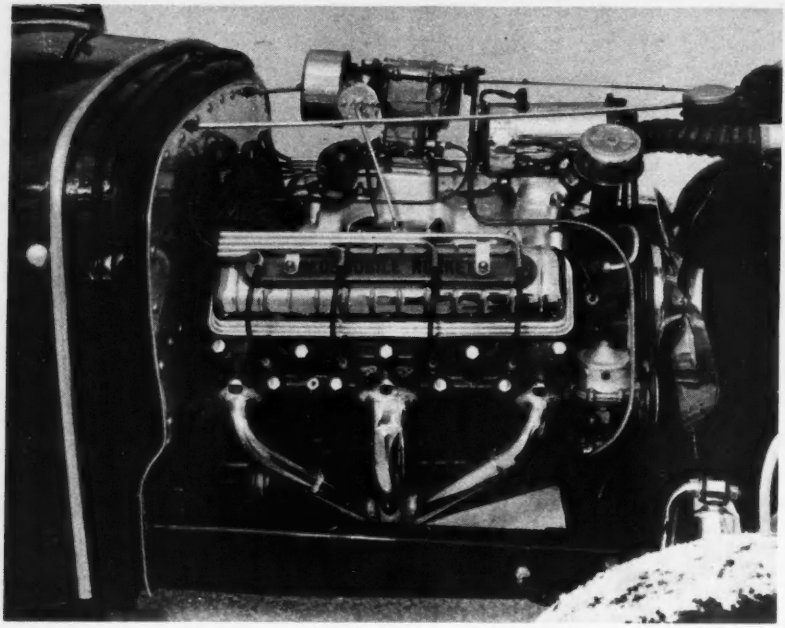
(Continued on next page)



Deck lid lifts to show how much gear can be packed into trunk of a good street rod.



Rear bumper of Conrad's car was made from steel rod, chromed. Note license bracket.



Engine, well chromed, is almost stock Olds. Headers and head-mill being the main changes.

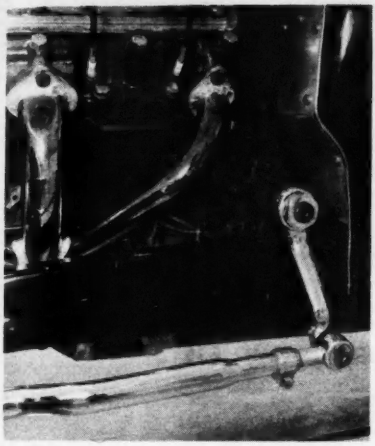
COVINGTON ROCKET continued

The front end was discarded in favor of a dropped Dago axle and rocker-type spring perches, the upper ends of which form the lower shock mounts, giving an extremely flexible and good riding layout. All unnecessary holes in the frame were filled and the whole works given a coat of rubbed lacquer.

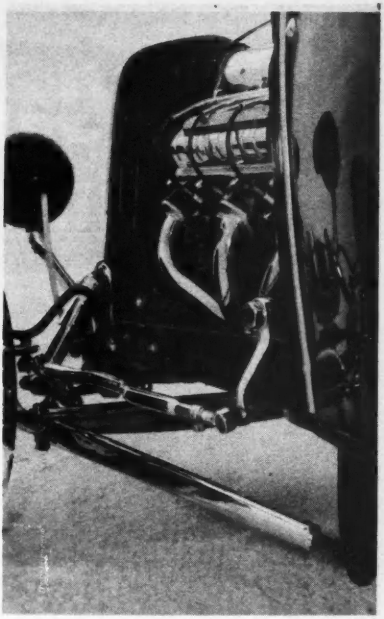
Then came the body. The firewall was cut away and replaced with a highly polished aluminum goodie cut to fit over the frame. The body mounts were raised to permit a channel job of four and a half inches at the front and 10 inches at the rear. This accounts for the level appearance of the car despite a forward rake of five and a half inches in the frame caused by the Dago axle and the 8.20 by 15 rear tires.

The interior of the body was given a full upholstery treatment in red and white Naugahide by a Cincinnati, Ohio, top shop. The exterior was given a glistening 20-coat black lacquer job, rubbed to perfection. On top of this went a beautifully finished *stock* top, one of the best we've seen. With a stock height windshield, Don doesn't have to bend his not-inconsiderable frame like a paper clip to get into the rig.

The story of the engine is a tale within a tale. The first mill that went into the car was a full-house Merc that had quite a few oats. However, Don took the car up to Granatelli's Half Day drag strip and got soundly blown off by the roadsters powered with Caddie and Olds engines. It was a matter of fighting too many inches and too little breathing. Back went Don to sell his Merc and to purchase an Olds engine. Outside of a .090-inch milling job on the heads and a set of nifty "W" type headers, the big churn is stock but even so, Don cranks up an honest 87 mph in the quarter, a fairly haulin' speed when you figure that the engine is docile enough for any kind of traffic condition.

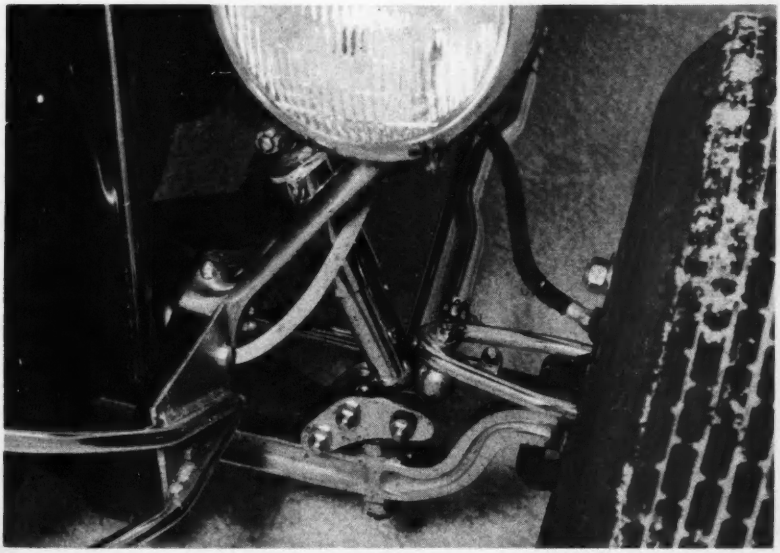


ABOVE—Steering column was shortened, '32 box moved back along frame to firewall.



RIGHT—Frame rail was filled and painted. Drag link was kinked to provide clearance.

BELOW—Stock spring shackle was discarded, combination shock-spring mount made.



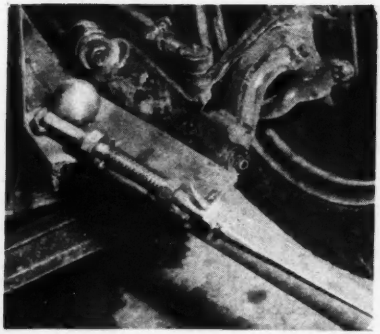
Garage Gimmicks

Quick-Release Tow Bar

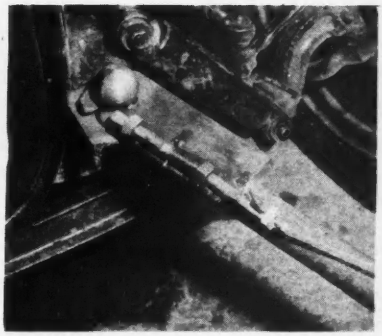
San Diego's Quints Car Club members demonstrate their unique tow bar arrangement.

THE IDEA of towed starts rather than push starts at race meets is often frowned upon and generally with good reason. When a hot car is towed to a start, quite often the surge of power will cause the towed machine to ram the tow car before the driver of the race car can stop. However, many cars are set up so that a power push-start could damage the rear end of the body. The need for muscle power to get the car started can be wearying in the extreme, at least to pit crewmen, and annoying to the driver.

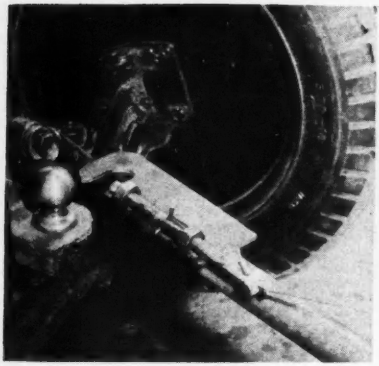
Here's a neat gimmick that was dreamed up by one enterprising (and no doubt fatigued) crew to allow safe towed starts. The idea is a quick-release tow bar that can be disengaged from within the tow car on the starting line without the danger of getting a mashed hand. The photos show how it works, as well as how it's built.



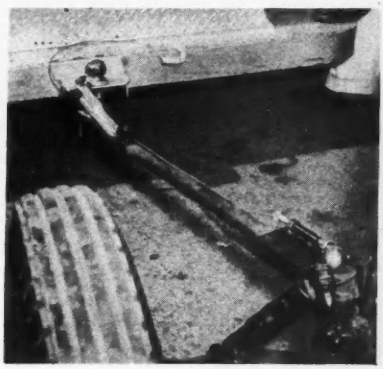
Here you see the bar attached to the ball hitch with the spring-bolt holding it on.



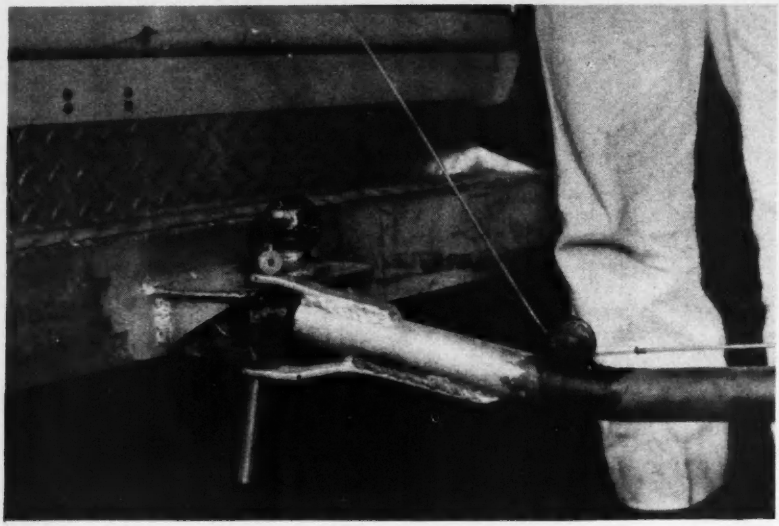
A tug on the cable fastened to the spring-bolt draws it back, opening the bar's hook.



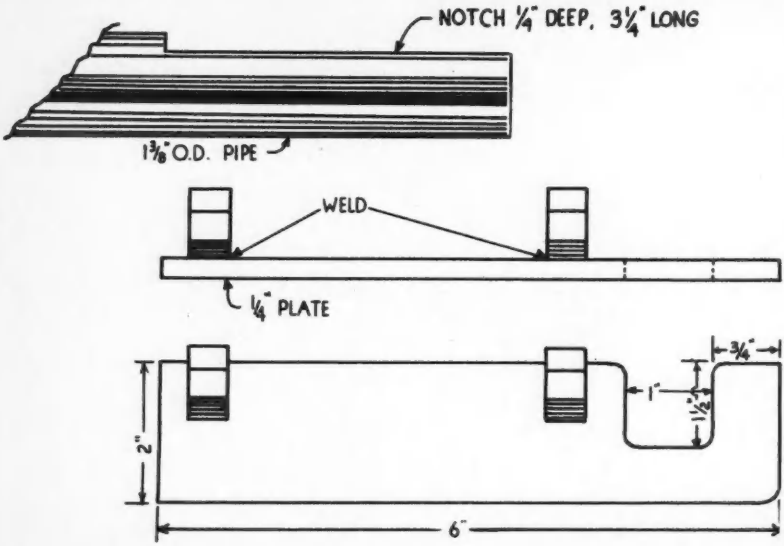
With the hook opened, the bar may be pulled off ball-hitch, setting roadster free.



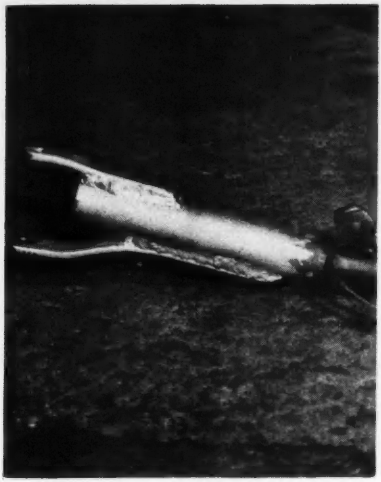
Here the bar is attached as it would be in towing car. Forward hitch is simple clevis.



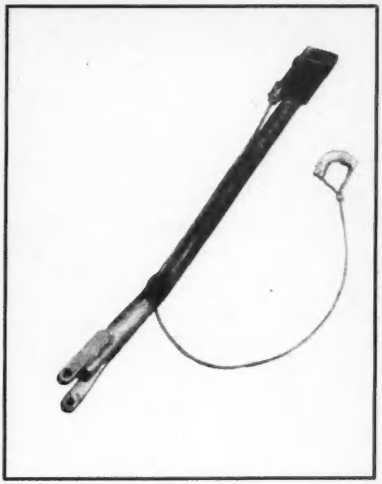
Two quarter-inch straps, welded to the bar at the forward end are drilled for a pin. Forming a clevis, this can be hitched to a ring-bolt or plate on the rear of tow-truck.



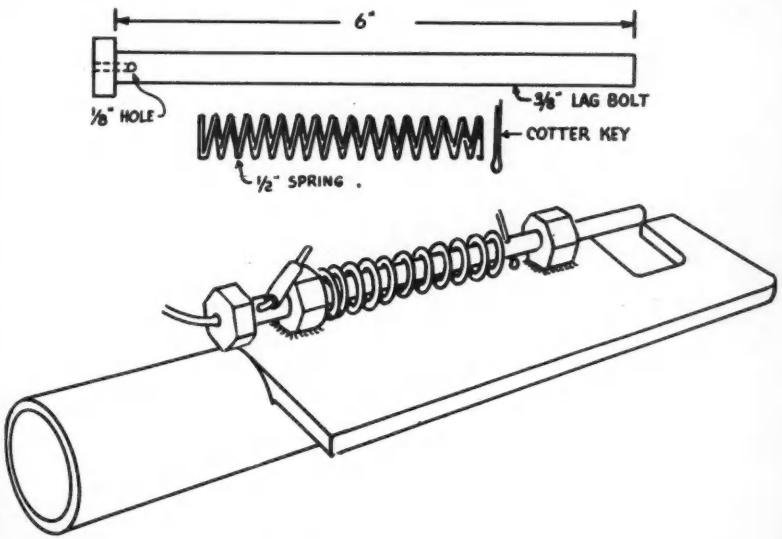
Drawings show each piece of simply constructed hitch and spring-bolt attachment that



A small pulley is welded to forward end of bar to carry the release cable to the bolt.



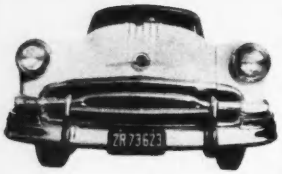
Here's the total layout, showing the well-padded cable handle and both ends of bar.



holds it in place. Cable used for release is aircraft control equipment. Bolt should be loose.

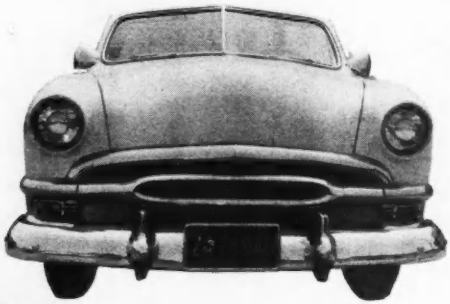
STYLE REPORT:

PONTIAC—THE UNIVERSAL GRILLE

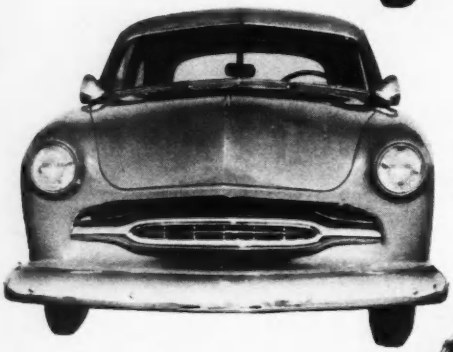


"STYLE REPORT" is another semimonthly department making its bow in the pages of CAR CRAFT this month. In short, it is designed to show the latest, up to date, customizing components in use and in as many ways as we are able to photograph. In the October '54 "Torch Tips" we showed you how to install the popular '54 Pontiac center bar, so to get "Style Report" off to a rolling start, here are seven variations on that theme.

Photos by Barris, Medley, D'Olivo

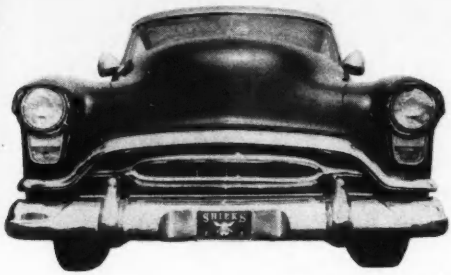


One of the simplest approaches is the '50 or '51 Ford. A kit is needed to connect the top grille bar and hood on the '50.



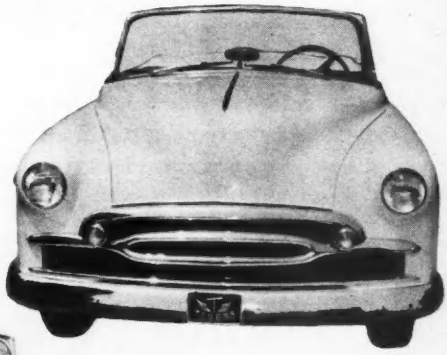
A more expensive but effective method is the moulding in of all grille pieces. The cost, including the Pontiac bar: $100.

A similar example is this '51 Ford with floating-type grille effect. End spinners were made from a pair of spotlight shells.



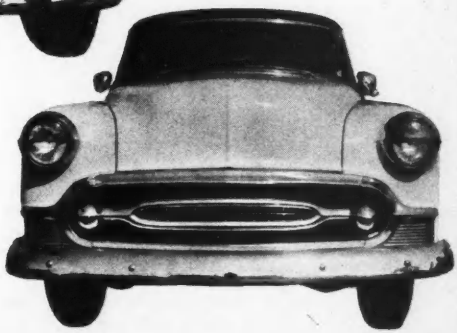
Pontiac bar in Olds lends neat styling. All that is needed for installing is to cut and fit the ends of bar to grille's opening.

One of the naturals for the Pontiac bar is the '50 Chevrolet. Remove the stock crossbar and insert the new bar fitting ends.



The '52 Chevy presents the same installation procedure as the '50 Chevy only the outcome is a completely different face lifting.

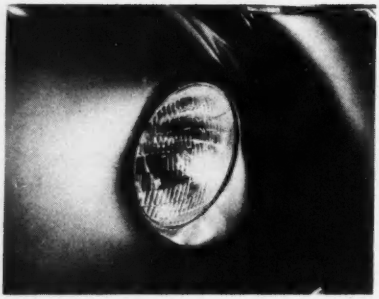
The '53 Chevy is left out by no means; here the Pontiac bar is installed in a floating manner. End spinners are '53 Lincoln.



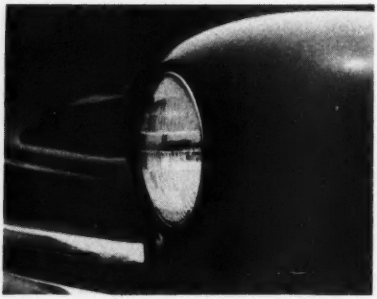
GRAB BAG
Frenched Headlights

By Dick Day

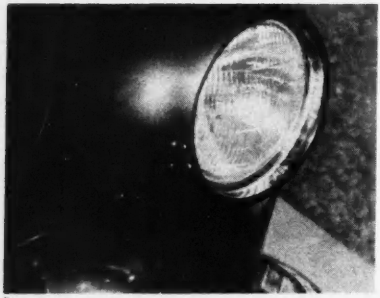
FRENCHED headlights go back as far as the prewar days. At that time, 1940 and '41 headlights were either filled in to the fender with sheet metal and rolled edges, or with stock rims welded solid, flush with the headlight lens. This method lasted until '51. Then Mercury came out with a deep headlight rim which started the now popular tunneling phase. In the last few years almost all the automotive manufacturers have incorporated one kind of a headlight ring or another, until now the body shops can come up with as many different arrangements as you can name or design. Here are sixteen of 'em!



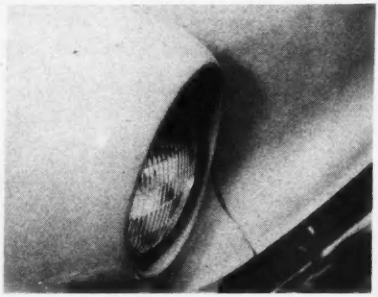
'40 Ford headlight's chrome frame was entirely eliminated. Lamp unit is housed in special tubing frame and then filled in.



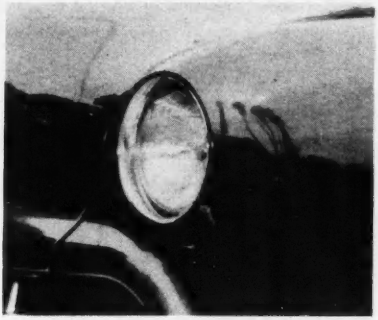
From '41 to '50 this was style. Stock ring is welded solidly to fender then leaded smooth. Headlight unit has to be reversed.



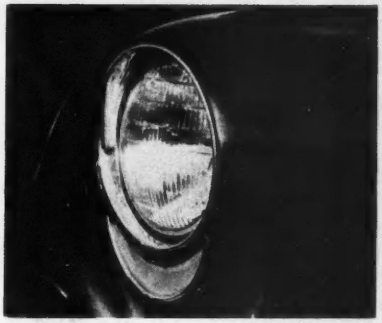
In '51 when Merc came out with their deep ring the headlight style changed to this tunnel effect ('51 Merc ring on '49 Merc).



A different approach with the '51 Merc rings is this design. Simulated shade was made by splicing top half of another ring.

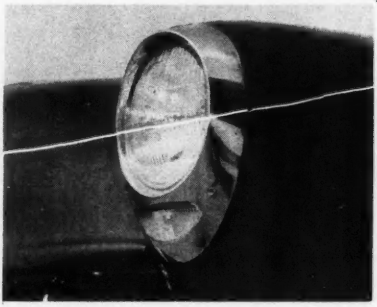


In '52 Ford brought out headlight ring with a deeper tunnel and a chrome inner ring. They have proved the most popular.

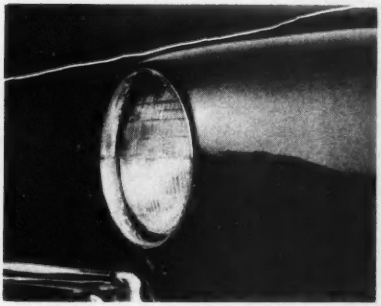


Another gimmick of the '52 rings is to splice top half of another Ford ring at angle. Special parking light is also a ring.

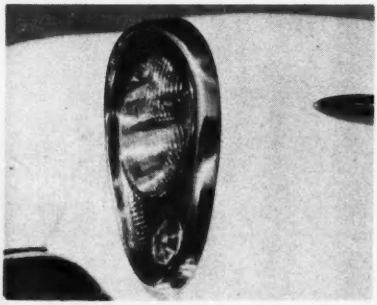
Photos by Medley, D'Olivo, Barris



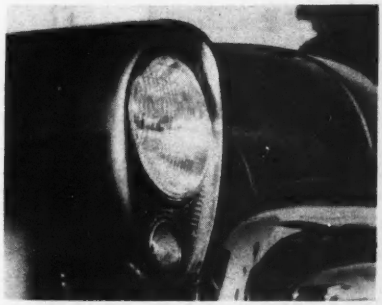
Extension of fenders was next up for style. Front section of Studie fender was spliced on with the headlight trim remaining stock.



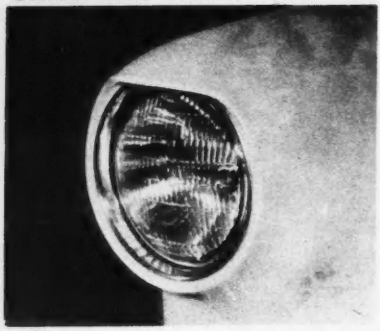
Some with their originality theme built extensions from sheet metal utilizing the deep '52 Ford headlight ring and inner ring.



In '53 Buick came into the picture with its oval, checker board headlight unit. For the larger cars it worked well in stock fashion.

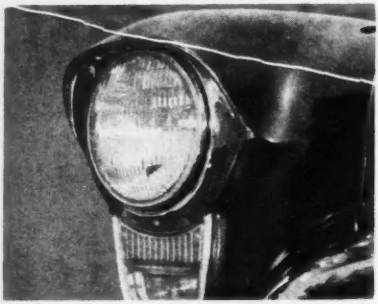


Extending and frenching '53 Buick headlight trim gives a terrific effect. This particular unit was extended five inches.

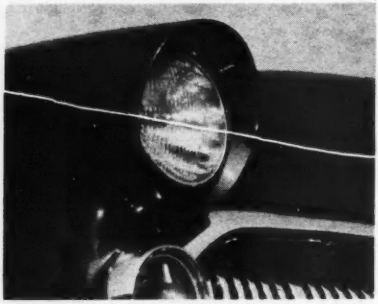


'52 Ford rings, outside and inside, were used on this '54 Olds. Tubing used to give rolled edge. Small shade is sheet metal.

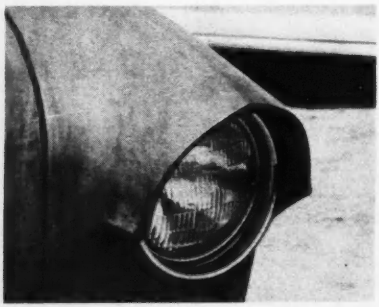
One of the most unique styling of headlights is this special tubing and sheet metal extension and perforated inner ring.



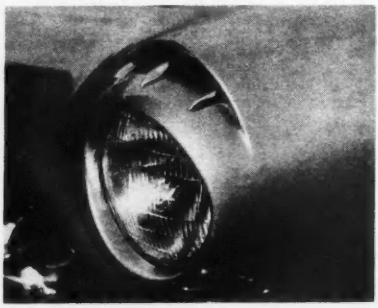
The '54 Caddy lipped headlight is fast becoming the new popular style. It will fit late body style of Olds, Chevy and Ford.



Another new look for the lipped headlight style is this fashionable shade. It was constructed from sheet metal and tubing.



Stylish and different is this approach. Headlight has a '52 Ford ring frenched under this specially constructed metal shade.



A futuristic design was accomplished by splicing two '51 rings together at their centers. Another ring houses '53 Merc bars.

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MERRY XMAS and HAPPY NEW YEAR
THE STAFF
WAR SURPLUS

CHEV-GMC

(*Continued from page 15*)

haust port. Blending and removal of the old insert seat is best done with a tapered reamer, preferably piloted. This is followed by a hand-ground blending in the exhaust throat area to obtain gradual curves. Next the entire combustion chamber should be finished as shown in the comparison photo. Last of all, the valve seats should be ground and the valves checked for seat placement. Removal of the exhaust seat insert will increase the exhaust valve size from $1\frac{9}{16}$ inch to $1\frac{11}{16}$ inch. Gain in exhaust throat area is not the only objective here. Rather more important is the removal of the potential hot spot caused by the insert itself which is not desirable in a competition engine with a cast-iron head. As the chief advantage of the later 270 head was in the port and valve size increase, use of the 270 H (late head) or the 302 is recommended. As in any head modification, you'll stay out of trouble by following the original contours, rather than striking out for yourself. Our articles on this phase of the work in September and October CCM might be consulted before you start serious work in the excavation.

Competition Heads—Special

At present only two heads are available for use on the GMC engines in this special category. The Wayne GMC head is unique among presently produced designs because the head incorporates no combustion chamber. The chamber is actually formed by the pistons being below block surface level at top center. Valve sizes are thus strictly limited by bore size. The biggest advantage this head possesses is in the additional port areas through the use of 12 ports. The valves are vertical and the actuation of them is by conventional rockers. Material of this head is cast iron.

Unique in other ways is the Fisher 12-port head. This beauty is cast of 356 aluminum and weighs a mere 32 pounds. Design wise, this head might be considered a descendant of the Wayne 12-port. Both were conceived by Wayne Horning. Both have since been modified in detail by their present producers. Bill Fisher has recently made more design modifications which should enhance the performance. Although a few aluminum heads have seated intake and exhaust valves directly upon the aluminum, this arrangement is generally unsatisfactory due to "pounding out." The usual solution is to cast in, screw in, or shrink in inserts of harder, less malleable metal. Most designs of this kind use separate rings for intake and exhaust seats. However, Fisher's latest wrinkle is to utilize integrally-cast, spectacle-shaped inserts. The objective is less distortion and better valve seating. These cast iron inserts have the same coefficient of expansion as the aluminum to prevent stress separation. As in the older Wayne, ports are well-shaped and of adequate size. Fisher's 12-port also incorporates a two piece rocker cover which eliminates oil loss during valve adjustments by providing a "well" to retain the oil. Both of these heads are naturals for installation of injectors and produce over 1 hp per cubic inch on methanol on this set-up.

Digressing back to the Chevrolet, Nicson Engineering has recently produced a stock appearing aluminum Chev head. It employs cast-in seat inserts similar to the Fisher. Available in a variety of CR options, this head might interest the dyed-in-the-wool Chev hound who wanted to extract the ultimate go out of a Chev-based engine. As its combustion chamber is basically Chev, the chief advantages this head could offer would be larger ports and better heat dissipation for use with loaded fuels. Its manifold surfaces adapt to the stock Chev manifolds or to any of the multi-carb installations available for the stock head.

Valve Train

Relative to valve trains on the GMC the situation shapes up as a vicious circle. We make this observation because of the nasty spring tensions that the average buyer thinks are necessary.

With a comparable weight of train in another six cylinder engine, we have produced satisfactory valve gear operation at 5800 rpm with spring tensions nearly 50 pounds less than the average GMC lash-up. Very seldom does the average customer take advantage of lighter weight *at the valve* to stay out of valve float.

GMC fabricated rockers No. 2193772 are eminently satisfactory jigglers and we heartily recommend them. Tubular push rods are also indicated and the wild actions that the current cams impart have made necessary thicker wall tubing to avoid flexing and bow-

(*Continued on page 62*)

HERE'S HOW

(Continued from page 23)

rolled over the tubing and welded at the bottom. The back of the seat was made of strong canvas (salvaged from the wrecked plane) laced to the framework with stout cord. The total weight of the seat was 6½ lbs. The seat was secured in place by arc welding the pads at the bottom of the legs to the top of the car frame, after small sections of the floor had first been cut away.

The battery box was cut out of the right front section of the firewall with an acetylene torch. A hole was cut in the floor in the left rear portion of the car and the box was welded in this position. A cover was made of light gauge galvanized sheet metal and fastened to the floor with sheet metal screws. This cover was to prevent spilling of acid inside the car in case of an accident. By changing the battery location, it reduced the weight on the right front side where any extra weight increases the danger of a blown tire or a broken wheel and added the weight to the left rear where it will aid in keeping the left rear wheel on the track in the turns.

The specifications of most clubs require that the gas tank be inside the body. Accordingly the original gas tank was removed and discarded and a new tank was made from a new surplus G.I. gas can. An old hand type grease gun was used for the filler neck and cap. This was welded in the position shown after a hole somewhat smaller than the inside diameter of the filler neck had been cut in the tank.

NOTICE—The tank was kept nearly full of water during cutting and welding as a precaution against an explosion in case the tank had ever had gas in it. Any tank which has recently had gas in it should also be washed out with a liberal quantity of carbon tetrachloride.

A ⅜-inch hole was drilled in the lower right hand corner and a ⅜-inch gas line fitting was silver soldered in place. The tank was then thoroughly dried out and coated with oil inside and primer outside to prevent rust. A new gasket was made of sheet lead for the original filler cap which was then drawn up very tight and safety-wired. The left rear of the car was chosen for the location of the new gas tank. Holes were drilled in the floor and it was strapped down with straps made from regular gas tank straps. Large diameter washers were used between the nuts and the underside of the floor as a precaution against the straps pulling through. Padding made of old canvas belting was placed between the straps and the tank.

$\frac{3}{16}$ copper tubing was used for the gas line. The tubing was annealed before installation to decrease the danger of cracks. The line was clamped to the body at a number of places using sheet metal clamps insulated with rubber. In this way the gas line is kept from vibrating. A line which vibrates will soon crystalize and break. A shut off valve was placed in the line within reach of the driver as an added precaution against fire. A small fire extinguisher was also placed by the driver's seat.

A firewall made of 18 gauge galvanized sheet steel was placed between the gasoline tank and the driver's seat and brazed in place. This was made to slant backwards toward the cut out rear window as much as the width (36 in.) of the sheet would allow. In this way the fire wall also served the additional purpose of deflecting the air, which entered through the side windows, out the back. In this way the parachute effect is minimized. By brazing the firewall to the body all the way around, the structural strength of the body was increased.

The hood was trimmed even with the front of the upper radiator tank. A piece cut from an old tire cover was welded to the front of the hood to prevent air from entering under the hood and being held against the wall back of the engine again giving a parachute effect. Hood sides made of tight metal will also be installed for the same reason.

Two small steel hinges hold the back of the hood and yet allow it to be raised. They were welded to the cowl and fastened to the hood with screws. Hinges must be in line with each other and in the proper location to work properly. A light framework made of thin tubing is used to fasten the front of the hood and keep it off the radiator.

CHEV-GMC

(*Continued from page 60*)

ing. It is a matter of general agreement among most of the engine builders that lighter valves and less spring tensions would suffice for the best peaking speed of the GMC, 5500 rpm. However, as the average customer will not take care enough on assembly and tuning, the hammer and tongs approach is necessary. This is a sad state of affairs which almost makes us itch to build one of these monsters to prove the point!

The train stress shows up in another regard by fatigue of rocker shafts and deflection of rocker shaft stands. This phenomenon can be proved easily by mounting a dial gauge on the head and placing its stem on the end of the shaft. Cranking the engine over will show deflection at this point which is not the happiest situation.

To remedy this, Bill Fisher can furnish heavier wall rocker shafts and heavier shaft brackets. These items are not now in production but will be if demand warrants.

Recent developments in camshafts for the GMC have tended toward the 290 degree duration for drag work. These are available from various grinders for use with either roller or barrel cam followers.

We were told that the 302 engines had cast camshafts which are not desirable for durability when reground. The solution is to use the forged 270 cam for this purpose. Compatibility of shaft and follower is important and a follower of material which was originally used with that cam should be obtained. Push rod and follower combinations may be worked out using the Chev type "high" follower which requires a correspondingly shorter, and therefore stiffer pushrod. At any rate, be specific when you order your pushrods so that you will receive the proper length. McGurk furnishes five different lengths from 10$^{7}/_{16}$ inches to 13 inches in length to take care of all Chev and GMC combinations.

Spring Kits are available for all categories of tuning. The all-out kit contains dual springs which measure around 100 pounds compression at 1$^{13}/_{16}$ inch compression and from 230 to 270 pounds, valve open, depending upon cam lift. While we are in no way suggesting that springs of this tension are not needed, we feel that experiments in the opposite direction would prove worthy. Why set up the engine for 500-100 rpm more than the point at which it develops peak hp?

Oil System Modifications

Of considerable merit on your valuable engine is the use of a full flow filter. The block is simply modified by tapping with a $^{9}/_{16}$ NF tap and screwing a $^{9}/_{16}$ inch plug into the main vertical oil gallery. Then a $^{19}/_{32}$ inch hole is drilled into this gallery from the side. Drill at 90 degrees to the outside of the block to pick up the maximum "meat." Tap this out to $^{3}/_{8}$ inch NPT, same as the pressure boss above it. Aircraft fittings for $^{3}/_{8}$ pipe to $^{1}/_{2}$ inch hose are then installed. Neoprene hose of low pressure AN grade of $^{1}/_{2}$ inch I.D. long enough to plumb to the filter is obtained. Chrysler filter #11Z2921 as installed on the 1946 Chrysler 6 is suitable for use. Various aircraft filters can be used; among them is the Cuno filter, a self-cleaning beauty. Just be sure that the filter you use is designed for full flow and not just by-pass service. In road and track competition an oil temp gauge is a smart investment. GMC's that exhibit oil temperatures around 300 degrees Fahrenheit should also be equipped with a surplus oil cooler. This should be plumbed into the filter line after the filter and in series with it.

Much doubt exists as to the proper viscosity of oil to use in the Chev and GMC. This depends to a great extent upon the conditions of use. Sustained running at full throttle will probably require an SAE 50 Heavy Duty oil, while normal pleasure driving would indicate either an SAE 20 or 30 Heavy Duty. If serious pressure drop is experienced with the oil hot, either the pump is too small, bearing leakage rates are excessive or oil of too light viscosity is being used.

Carburetion and Manifolding

So many options are available here that no specific recommendations will be beneficial. The writer prefers the Stromberg carbs of proper venturi size because of their simplicity and ease of tuning. Over-carburetion occurs more often on road jobs than on the all-out models, but a good progressive system is sorely needed for these brutes. A good example of how properly selected and well-tuned rigs can operate is the Doyle GMC pickup. This beauty idles like a kit-

(*Continued on page 64*)

a great new addition . . .

Between the covers of this brand new Trend Book is your opportunity to gain a world of technical know-how. If you're planning to "do-it-yourself," this is a must!

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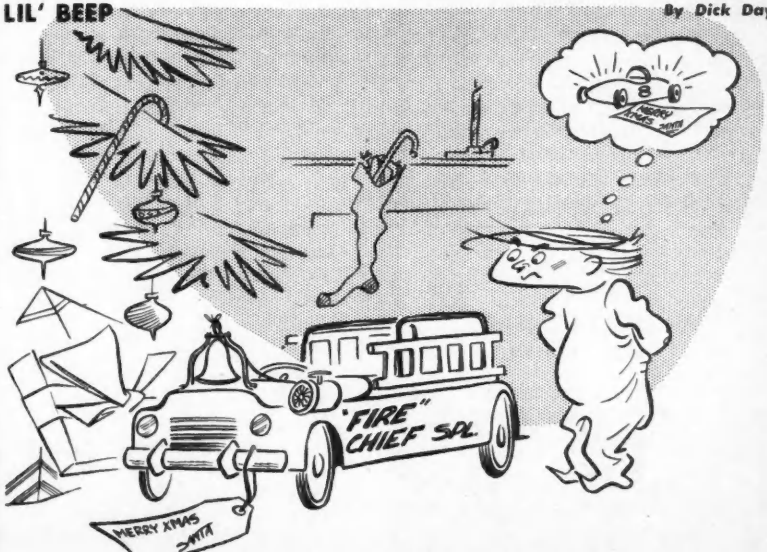
LIL' BEEP — **By Dick Day**



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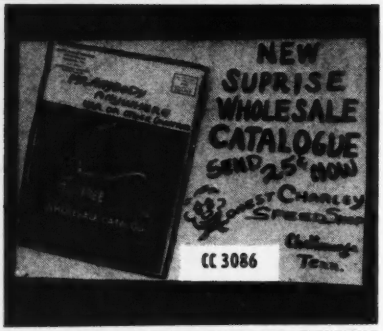

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write BOX 9, WATERTOWN, MASS.

CHEV-GMC

(*Continued from page 62*)

ten with a Winfield Super 4 C cam and 4 Stromberg 81's atop a Wayne 4 carb long manifold. The secret is a common sense method employing a flow-balancing device made by George Doyle, a purist in these matters. This made us happy because we have always maintained that poor tuning was the fault with many erratic-idling, poor-accelerating multi-carb installations.

After much brain sweat expended in pursuit of the foregoing data, we strongly recommend that anyone contemplating the building of either the Chev or GMC obtain one of the excellent manuals which have been done for them. It is not within the scope of these articles to fully cover all phases which may confront the builder, but only to aid the prospective builder in avoiding pitfalls. Learn all you can before you start and buy the best and assemble it with deliberate care. The GMC Cult has made many converts and small wonder, for it is full of surprises at every turn. Just for fun and to kick off a bit of controversy, we'll conclude by giving our own idea of two "Jimmie" conversions. We'll probably get a few arguments, but arguments, properly stated, are what make competition so interesting. Pull up a chair.

Our favorite road engine:
- Bore and Stroke—$3\frac{15}{16} \times 4$ 292 cubic inches
- Head—302 modified
- Block and Crank—270
- Valves—$1\frac{13}{16}$ intake $1\frac{11}{16}$ exhaust, lightened
- Cam—270° Spalding
- Manifold—3 carb, progressive opening
- Ignition—Spalding, Fisher or modified stock

Our favorite all-out, no-holds-barred GMC:
- Bore and Stroke—$4\frac{1}{8} \times 4$ 320 cubic inches
- Head—Fisher 12 port
- Block and Crank—302
- Valves—$1\frac{7}{8}$ intake $1\frac{11}{16}$ exhaust, lightened
- Cam—290° Spalding
- Carburetion—Injectors
- Ignition—Spalding two-coil or Fisher two-coil

BIG GEARS FOR BIG ENGINES

(*Continued from page 39*)

most identical to Fordomatic ratios and near to the .26 tooth Lincoln Zephyr.

Comparing this box with our previous example:

	60 mph, high	60 mph, 2nd	30 mph, 1st
Ford late	2900 RPM	4700 RPM	4000 RPM
Cad '37-'50	2900 RPM	4350 RPM	3500 RPM

If you aren't sold by now, you don't want a better gear box, anyhow.

Upon tearing down this jewel box, these tired eyes glowed when they lit upon the very beefy pin-type synchronizers on 2nd and 3rd gears. These are similar to some of the best truck trans synchros and should handle any full-bore application.

How To Button On The Gearbox

The first application we saw was to adapt a late Cad engine into a 1936 Ford chassis. This was a natural, as the bell housing bolts on to any Cad (designed for 'em, you know). At the rear end of the trans there was a different tale (or tail) to tell. The Cad output shaft is about 2½ feet long and designed for a normal Hotchkiss slip joint at the rear. This was to be mated to the Ford torque tube drive so it had to be chopped nearly 18 inches and the stubby remaining shaft splined to wed the Ford "U" joint. Cook Machine Works, makers of the Cyclone housings and quick-change rear axles, are set up to do this job and they did it reasonably and precisely. The Ford rear bearing retainer was machined to sit over the Cad rear bearing snap ring. It is also necessary to plug the former larger bolt circle holes in the rear case face. This can neatly be done by tapping the holes out to ¼ pipe thread and plugging the holes with ¼ pipe plugs with Allen heads. This produces a flush plugging job.

If the box is to be used on a Chev or GMC it will be necessary to install a spacer between the Chev bell housing and the transmission front face. This aluminum "plank" must incorporate a drain-back recess and centering shoulder to align the bell housing to the transmission. This particular adaptation was made by Bill Fisher. He is willing to reproduce the setup for $45 with the buyer furnishing all transmission parts and exchanging the stock output (tail) shaft.

Most transmissions we have checked required only thorough cleaning and assembly after inspecting and replacing any worn minor parts. An occasional bearing should be replaced if loose, worn, or noisy. Clean the bearing well with solvent and spin it dry while holding it near your ear. Replace the noisy ones on this test. Any worn thrust washers or cluster needles should also be replaced. We understand that internal parts for these transmissions are stocked by some GM dealers.

On the Cad engine job, the trans was driven through an Olds 49-54 export 11 inch disc. This was adequately squeezed by a Ford 8 MTH pressure plate. Same as Cad, but oh-so-much cheaper! On the "Jimrolet" adaptation a Rockford pressure plate will be used in conjunction with the Olds 11 inch disc. A little spline matching would probably reveal other good discs which could be used.

Dreaming Again!

While figuring the ratios in this Cad box we noticed that the cluster is driven at .81 times input shaft speed. If the rear of the case were bored out to mount the cluster on ball bearings and a shaft driven by the cluster extended out the rear of the case, this shaft could produce a new gear ratio. If this drive gear was then mated with a gear of the same size idling on the output shaft, but engaged by another synchronizer, the drive ratio would be 1.23:1 through this new train. Here then would be our close ratio racing box:

4th (old 3rd)	3rd (new)	2nd (old)	1st (old)
1:1	1.23:1	1.52:1	2.4:1

A four inch thick cast aluminum spacer would be required to accommodate the new gear train behind the original box.

Other Possibilities

Frank McGurk adapted a Packard transmission to a hot Corvette (bored out to 279 cubic inches). He tells us that the trans was very beefy and could be shifted to low without clash at 30 mph (Synchro low?). It was actually a cannibalization of an earlier Packard stick shift cover to a post war column shift box.

(*Continued on page 66*)

THINGS TO COME

WE WEREN'T too brief, although we hope we were somewhat to the point in our Word From the Editor this month. In line with this point we've gotten word from Chuck Eddy that he's working on some goodies in the steering department, using stock parts as usual. First up is a nifty concerning how you can adapt your late model Ford for steering that doesn't feel as if you were winding up a rubber band. Another goodie in the same vein for those who have been bemoaning the passing of the fine old floor shift is an item by the same guy (good man, this lad Eddy) on how to convert the column shift to floor shift without chopping or butchering up anything. This is a perfect item for the driver of a channeled coupe or roadster who's tired of skinning knuckles on dashboards during fast second-gear shifts.

Those readers whose youngsters are at the age where they want to drive the family heap but whose feet are too short to reach the pedals may be interested in something new, particularly if papa has the yen to race and mama takes a dim view of the breadwinner tossing off broadslides. This is a solution to both problems—let the kids do the broadsliding. You may have read about it in the December *Hot Rod*. The cars are strictly kid size both dimensionally and financially. In an upcoming issue we'll tell and show you how you too can have a race driver in the family and have a ball in the process. You don't have to worry about the heir to the throne either. On short tracks and under the rules of the game the cars don't go fast enough to put the sprout on his head. In fact, in four years of running at various sports, not one moppet has been shaken up, let alone dumped. From what we've seen, it's safer than letting him climb trees or play Superman. Don't miss it.

NEXT MONTH:

BUILD YOUR OWN HIGH PRESSURE OIL PUMP

BIG GEARS FOR BIG ENGINES

(Continued from preceding page)

The marriage required some repositioning of shift rails to adapt the wiggle stick. Mating of the Packard case took place at the Corvette bell housing, similar to the Jimrolet-Cad marriage explained above. A Chev truck disc fits the Packard splines and a Chev throw-out is used.

This case illustrates our first point, that a little imagination and junk yard sleuthing should mix up some brawny new gear boxes for our hungry, big engines.

STATEMENT OF OWNERSHIP

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF CAR CRAFT MAGAZINE, published monthly at Los Angeles, California for October 1st, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: Robert E. Petersen, 1028 N. Kings Road, Los Angeles 46, Calif.

Editor: John P. Christy, 20936 Gault Street, Canoga Park, Calif.

Business manager: Theodore A. Johnson, 4717 Don Pio Drive, Woodland Hills, Calif.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

TREND, Inc., 5959 Hollywood Blvd., Los Angeles 28, Calif.

Robert E. Petersen, 1028 N. Kings Road, Los Angeles 46, Calif.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

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4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

THEODORE A. JOHNSON
Business Manager

Sworn to and subscribed before me this 7th day of October, 1954.

J. A. THOMPSON

(SEAL) (My commission expires May 24, 1958.)

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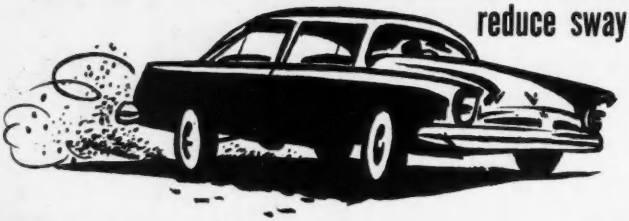

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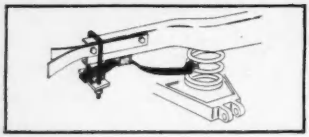

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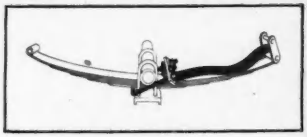

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